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Skeptical Inquirer

THE MAGAZINE FOR SCIENCE AND REASON

Vol. 37 No. 2 | March/April 2014

THE BURZYNSKI BATTLES

FOUR DECADES OF **UNPROVEN** CANCER CURE CLAIMS

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David H. Gorski

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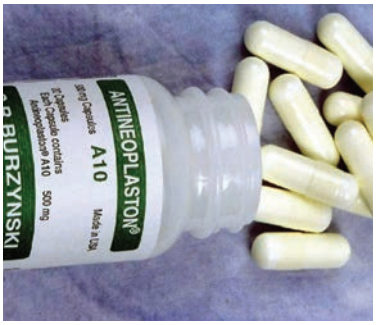

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[FROM THE EDITOR

The Burzynski Affair: Forty Years and Counting

Questionable medical remedies sometimes flash onto the scene and quickly disappear. Others have long runs that frustrate all well-meaning scientific efforts to counter them.

We devote two special articles in this issue to Stanislaw Burzynski, MD, PhD, and his—to put it mildly—controversial claims of near-miraculous cures of an array of cancers. Since founding his Burzynski Clinic in Houston in 1977, Burzynski has been a thorn in the side of responsible medical scientists and regulators. For four decades he has been contending that something he calls antineoplastons have significant anticancer activity—something that multiple studies by outside groups have been unable to show.

In this issue, cancer physician David Gorski, also an MD and PhD, begins our coverage with a comprehensive primer for skeptics about Burzynski and his career and claims. It is a fascinating story. Burzynski, like many scientists who veer into dubious and highly controversial areas, started out as a legitimate medical researcher with what seemed a promising career. But something changed, and for decades now he has been advancing his questionable theories and treating cancer patients based on them. From the late 1970s to 1998 he was under nearly constant investigation by a variety of medical authorities. In 1995 he was indicted on seventy-five counts of insurance fraud and violations of the Food, Drug, and Cosmetics Act. But Burzynski has some powerful political allies who dragged the FDA commissioner into congressional committee hearings four times to ask why the agency was "harassing" him. And so things have gone. For all these decades Burzynski has avoided being shut down and has continued to apply his unproven cancer "cures." He has managed to frustrate regulators whose job is to protect the public and scientists who have a duty to inform the public. But now, perhaps the tide is turning.

Gorski, founder of the first-rate *Science-Based Medicine* blog and a Fellow of our Committee for Skeptical Inquiry, has been following Burzynski for years. He worked on this specific article for more than a year.

Gorski's article is complemented by Robert J. Blaskiewicz's lively report on how skeptic activists have recently been aggressively challenging the Burzynski Clinic's dubious claims and alerting the public. It's a surprising story of skepticism in action. Some say consumer protection is skepticism's most important role. Here is the revealing story of that innovative and welcome effort in the Burzynski affair.

* * *

All of us who love science are looking forward to Neil deGrasse Tyson's continuation of Carl Sagan's *Cosmos* series, to begin airing on both Fox and the National Geographic Channel in March. Like Sagan before him, Tyson is a master explainer and enthusiastic champion of the inspirational qualities of science. We are proud that, as was Sagan, both Tyson and Ann Druyan (Sagan's widow and cowriter with Steven Soter) are distinguished Fellows of the Committee for Skeptical Inquiry.

—Kendrick Frazier

Committee for Skeptical Inquiry
"… promotes scientific inquiry, critical investigation, and the use of reason in examining controversial and extraordinary claims."

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Library of Congress Celebrates Carl Sagan in Gala Event

David Morrison

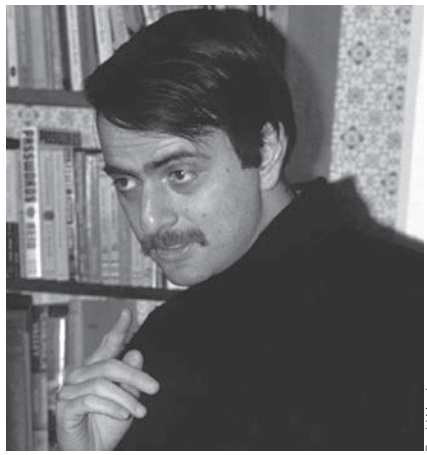
Carl Sagan died eighteen years ago, and he is still greatly missed. We scientists, educators, and skeptics sometimes ask ourselves how Carl would respond to today's world, especially the apparent increase in irrationality in public discourse. Some of these questions were raised by the speakers at a special event honoring Sagan held at the Library of Congress in Washington, D.C., November 12, 2013, attended by 800 invitees.

Carl Sagan was the best-known scientist of his time and a master teacher and popularizer of science. Through his elegant writing and speaking and his mastery of the then-new medium of television, he became the world's guide to the first great era of planetary exploration. As he noted, only one generation witnessed the transformation of the planets in our solar system from faint points of light in the night sky to worlds, each different, with its own style of geology, atmosphere, and perhaps even life. In 2015, the NASA New Horizons mission to Pluto will complete that epic initial exploration.

The Library of Congress meeting dedicated a new archive of Sagan papers (The Seth MacFarlane Collection of the Carl Sagan and Ann Druyan Archive). The large collection of letters, manuscripts, clippings, and Dictaphone tapes suggests that Carl never discarded anything from his public and scientific life. It makes the point of how limited the papers of contemporary scientists will be, since we write our manuscripts with word processors and communicate primarily by email, leaving few records for future historians. Seth MacFarlane and Ann Druyan are also the major force behind the new *Cosmos* TV series, being continued with Neil deGrasse Tyson as the star.

The speakers at this event (see box) ranged from John Holdren, the President's science advisor, and Ralph Cicerone, president of the National Academy of Sciences, to three former PhD students of Carl's (Chris Chyba, Steven Soter, and me). Although their brief talks were not coordinated, several speakers commented on Carl's devotion to encouraging young scientists. Both Neil deGrasse Tyson (Director of the Hayden Planetarium) and Jonathan Lunine (Carl's successor as the David Duncan Professor of Astronomy at Cornell University) brought with them their original letters they received from Carl when they were in high school. These letters provided friendly, straightforward encouragement for these two young students, whom Carl had never met, to pursue careers in science. Carl even hosted a visit to Cornell by Tyson, who decided, however, to attend college at Harvard. Both Tyson and Lunine credited this personal interest from Carl as critical for their decisions to pursue careers in space science. One can only wonder how many thousands of other young students were similarly inspired by Carl's interest in their future.

The second theme that emerged from these talks was concern about the rise in antiscience attitudes among the public since Sagan's death. It is shocking to realize that nearly half of Americans still deny the reality of biological and cosmological evolution and of global warming. There has always been public misunderstanding of science, of course, and Carl devoted much of his energy to trying to educate and inspire the public. But what is new is the politicization of science and the widespread attacks on the honesty of scientists, especially from those who deny human causes of climate change. I wonder how Carl would have reacted to accusations by political leaders that scientists routinely falsify their data, or the billboards erected by the Heartland Institute comparing climate scientists to killers like the Unabomber.



David Morrison

A young Carl Sagan (c.1969)

JPL/NASA

JPL Voyager scientists: James Pollack, Steven Soter, David Morrison, Eugene Shoemaker, and Carl Sagan in 1981

The Library of Congress Archive

Seth MacFarlane Collection of the Carl Sagan and Ann Druyan Archive, 1860–2004:

[http://findingaids.loc.gov/db/search/xq/searchMfer02.xq?_id=loc.mss.eadmss.ms013113&_faSection=overview&_faSubsection=did&_dmdid=]

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Speakers at the Library of Congress event

James Billingham (Librarian of Congress)
Seth MacFarlane (Film and TV Producer, Sponsor of the Sagan Archive)
Christopher Chyba (Professor of Astrophysics and International Affairs, Princeton)
Ralph Cicerone (President, National Academy of Sciences)
John Holdren (Director, White House Office of Science & Technology Policy)
Jonathan Lunine (Director, Center for Radiophysics & Space Research, Cornell)
David Morrison (Director, Carl Sagan Center for Study of Life in the Universe, SETI Institute)
Bill Nye ("The Science Guy," CEO of the Planetary Society)
Carolyn Porco (Imaging Team Leader, Cassini Saturn Mission)
Steven Soter (Research Associate, American Museum of Natural History)
Kip Thorn (Professor of Astrophysics Emeritus, Caltech)
Neil deGrasse Tyson (Director, Hayden Planetarium)
Ann Druyan (Author and TV Producer, and longtime partner of Carl Sagan)

From Our Archives

These and other Skeptical Inquirer articles by or about Carl Sagan are in the Carl Sagan Collection on our website at www.csicop.org/specialcollections/show/carl_sagan_collection.

Carl Sagan, "Night Walkers and Mystery Mongers: Sense and Nonsense at the Edge of Science," Spring 1986.
Carl Sagan, "The Burden of Skepticism," Fall 1987.
Carl Sagan, "Wonder and Skepticism," January/February 1995.
Carl Sagan, "Does Truth Matter? Science, Pseudoscience, and Civilization," March/April 1996.
"The Darkened Cosmos: A Tribute to Carl Sagan," March/April 1997.
Ann Druyan, "Ann Druyan Talks About Science, Religion, Wonder, Awe . . . and Carl Sagan," November/December 2003.
David Morrison, "Carl Sagan's Life and Legacy as Scientist, Teacher, and Skeptic," January/February 2007.

I wish Carl were still alive to help defend science and impress on the public the importance of seeking scientifically valid solutions to our current problems. His voice would be especially valuable in the area of climate science, since he was himself the author of several important papers that analyzed the greenhouse effect on Venus.

Carl did stand up for science in the face of political pressures, of course, through his leadership in arms control. His fight against the deeply flawed "Star Wars" missile defense system and his advocacy for nuclear disarmament were a major focus of the last two decades of his life. I well remember one of the annual meetings of the imaging science team for the Galileo mission to Jupiter. Carl participated enthusiastically in the two-day meeting. But at the end, when we went around the room to see what work supporting Galileo each of us planned for the next year, Carl said that, although he had greatly enjoyed these science discussions, the fact was that he expected to devote most of his time for the next year to saving the world from nuclear war. The Galileo meeting provided him a short respite from the very real problems confronting society.

I suspect that if Carl were still alive, he would have a difficult time making headway against the irrationalities that we face today. When Carl was the best-known scientist in the United States, there were only five television networks, so many millions of people were likely to see and hear him on *The Johnny Carson* show or *Cosmos*. All five networks were at least nominally politically neutral. Today there are hundreds of cable channels, many of them highly polarized, plus uncountable Internet blogs and YouTube videos. Most of the so-called science shows today are dismal. It would be difficult even for Sagan, with his brilliant communication skills, to compete for public attention.

Many of us who spoke at the Library of Congress mentioned Carl's last book, *The Demon-Haunted World: Science as a Candle in the Dark*. I have always considered it his most important book. Carl was a scientific skeptic (he was one of the founding Fellows of CSICOP, now the Committee for Skeptical Inquiry, and was keynote speaker at two CSICOP conferences), but he was also very aware of the limitations of science. Rather than just telling people the scientific answers, he tried to teach them to reason things out for themselves and apply logical thinking to their everyday lives. His is an example all scientific skeptics should try to follow.

David Morrison is Director of the Carl Sagan Center for Study of Life in the Universe, and a NASA senior scientist. He is a Committee for Skeptical Inquiry Fellow and an SI contributing editor.

Death of a 'Psychic': The Real Sylvia Browne

Bryan Farha

One of the world's most popular (and notorious) alleged psychics and spiritual mediums in history, Sylvia Browne, died November 20, 2013, at age seventy-seven (she had predicted on CNN that she would live to age eighty-eight). She suffered a heart attack in 2011 and reportedly had multiple strokes as well. These afflictions could explain why some very recently scheduled appearances were cancelled for "health reasons." She also claimed to communicate with the dead and she engaged in health readings, which I consider dangerous and, essentially, practicing medicine without a license. She was fortunate the California medical board didn't elect to pursue this.

Primarily due to a simple concept called *subjective validation*, she was able to convince much of the unsuspecting public of her self-proclaimed powers. She authored or coauthored forty-five books and built a multi-million-dollar psychic empire. It is unclear how much of the books were her own words—especially after Joe Nickell convincingly illustrated how some of her writings eerily resembled his previously published work.

Larry King and Montel Williams promoted her more than any other media sources.

Although she made a fortune and was likely laughing all the way to the bank (for example, one of her nonprofit 990 forms indicates a single operation brought in $417,051), her reputation was controversial, primarily due to her career-long record of inaccurate predictions and readings. These inaccuracies were mostly revealed by James Randi, Robert Lancaster, Benjamin Radford, Ryan Shaffer, and me (along with a few others).

Lancaster's superb website, Stop SylviaBrowne.com—as well as Randi's—represented almost daily efforts to keep the public apprised regarding the truth about Sylvia Browne. She endured justified criticism after repeatedly agreeing to be tested by the James Randi Educational Foundation for her alleged ability, yet never doing so. After previously dismissing the importance of the money, on television Browne said she avoided the test because she claimed Randi didn't have the one million dollar prize, as advertised. Thereafter, I went on CNN's *Larry King Live* and showed indisputable visual evidence of the $1,000,000 (an account statement from the independent investment firm, Goldman Sachs)—an embarrassing moment for Sylvia on live, international television. To my knowledge this was her last guest appearance on the show, where she had previously averaged about three appearances per year.

Sylvia Browne on the *Montel Williams Show*.

Primarily due to a simple concept called *subjective validation*, Browne was able to convince much of the unsuspecting public of her self-proclaimed powers.

Because she dodged Randi's test (in which she even agreed on CNN to the specific protocol), I decided to test her without her knowing it. A few days after Browne made several predictions on the *Montel Williams Show* for the entire upcoming year of 2005, I asked my niece's fourth grade class, individually, to predict the same measures. Data analyses indicated that the fourth-graders were, collectively, 25 percent more accurate than Browne was—and these children were literally guessing on many items they knew nothing about (like world affairs, natural disasters, and politics). This was the *real* Sylvia Browne.

In 1992, Browne and her ex-husband Kenzil Dalzell Brown were indicted on several charges of investment fraud and grand larceny. Following her felony conviction and divorce, she added the letter "e" to the end of her last name to understandably present a new persona to the public in light of her record of disgrace. This was the *real* Sylvia Browne.

Even though her staunch believers remained supportive, criticism of Sylvia continued when many of her highest profile predictions were not only proven wrong but some were perceived as downright heartless. On the *Montel Williams Show* in 2003, she told grieving parents that their missing eleven-year-old son, Shawn Hornbeck, was dead; instead he was found alive and well in 2007. In 2004—also on *Montel*—she wrongly told the mother of Cleveland kidnapping victim Amanda Berry, "She's not alive, honey." Amanda's mother died two years later, so she never was able to find out that her daughter was really alive, and it's possible that Browne's emotionally powerful prediction may have accelerated her death. Regarding the West Virginia coal miner tragedy in 2006, on live radio she predicted the miners survived—yet only minutes later they were confirmed dead. This was the *real* Sylvia Browne.

Sylvia Browne and her son, Chris Dufresne.

In 2005, she incorrectly told me on CNN that Osama bin Laden was dead. She also predicted aliens would visit Earth in 2010 and "teach us how to use anti-gravity devices . . ." Further, via articles in the Skeptical Inquirer, Ryan Shaffer pointed out in "Psychic Defective" (March/April 2010) as well as "Psychic Defective Revisited" (September/October 2013) that Browne wasn't accurate on a single prediction regarding criminal cases. She demonstrated little or no remorse for exploiting the bereaved. This was the *real* Sylvia Browne.

Regarding the West Virginia coal miner tragedy in 2006, on live radio she predicted the miners survived—yet only minutes later they were confirmed dead.

In 2011, Benjamin Radford created, using both personal and crowdsourced funds, two large vinyl banners reading "Convicted Felon Sylvia Browne," which were used in grassroots protests to greet her performances in several cities, including Las Vegas, Nevada. These and other failures and embarrassments resulted in the ultimate decline of her empire. Eventually, Browne put her San Jose office up for sale. This—including three office moves in as many years—is an indicator of how her star had been fading. Robert Lancaster received an email in November from an apparent Browne family friend indicating that Sylvia's son was even selling some of her assets in light of her health problems. Further, station KMOV (St. Louis) reported in 2010 that Linda Rossi, longtime business manager for Sylvia, revealed the Browne corporations' annual $3 million revenue had dwindled below 50 percent of that.

The first of her four husbands was Gary Dufresne, who shed light on how Browne's career began. He tells a story in which the two of them were hosting a party where she began experimenting with Tarot card readings with some of the invitees. In the kitchen, Dufresne asked Sylvia how she could tell people such unsubstantiated things. He reportedly told her, "You know it's not true, and some of these people actually are probably going to believe that." To avoid using vulgarity, he paraphrased Sylvia's response: "Screw 'em. Anybody who believes this stuff oughtta be taken." This was the *real* Sylvia Browne.

All this is justification for a fee of $860 per twenty-minute telephone reading from Sylvia, right? I'd like to be able to say that the job of psychic critics will now become easier, but this game is a bit like baseball: when one batter is out, another one steps up to the plate. Perhaps her son, alleged psychic Chris Dufresne? Granddaughter Angelia? Stay tuned.

Rest in peace, Sylvia.

Bryan Farha is editor of *Pseudoscience and Deception: The Smoke and Mirrors of Paranormal Claims* (University Press of America, January 2014).

Pseudoscience Creep: Science Museums, Universities Host Pseudoscience

Jessie Haynes

In September 2005, the Smithsonian Institution, a gold-standard name in science, was going to host a screening of an antievolution film by the Discovery Institute, primate-change deniers who prefer to be called proponents of "intelligent design." Museum spokesperson Randall Kremer defended the $16,000 contribution from the Discovery Institute by saying it "would be used to further scientific research." The *New York Times* shared the bare facts and stated the following about the antievolution debate: "Although Charles Darwin's theory is widely viewed as having been proved by fossil records and modern biological phenomena, it is challenged by those who say that it is flawed and that alternatives need to be taught." In September 2013, the Science Museum of Western Virginia, located in Roanoke, hosted a friend of the museum director and former astronaut, Edgar Mitchell, without care or regard (but with definite prior knowledge) of his parapsychology institute and groundless UFO claims. Nearby Virginia Tech also hosted Mitchell, allowing him to begin with discussing the moon and lead into describing his parapsychological Institute of Noetic Sciences and to assure visitors that "a government cabal is . . . covering up UFOs."

The museum spokesperson, Michael Hemphill, was oblivious to pseudoscience conflicting with actual science in a science museum. The program director at Virginia Tech, who organizes an arts and sciences event with assorted speakers for students, seemed shocked during the presentation when Mitchell assured audiences that UFOs were being covered up by the government but when asked to comment, he said with obvious discomfort he saw no problem with such content being presented in an educational institution. Both Knapp and Hemphill said Mitchell's views were "an important conversation" their institutions "needed to have." They also both emphatically repeated that their institutions did not endorse Mitchell's statements.

The *NeuroLogica* blog succinctly states the problem of educational institutions and science museums hosting pseudoscience: "Any time such an event can be exploited to use the reputation of an academic institution to promote pseudoscience, the institution has the right and responsibility to prevent such use. A direct endorsement is not necessary and should not be the threshold."

All but two news stories and a single interview in the sparse media coverage of Mitchell's visit were nearly verbatim from the museum's press release. Just one arts blogger asked Mitchell about his "more controversial views" and moved right on after that to just pushing the upcoming "fundraiser" at the museum.

The Science Museum of Western Virginia hosted a putative institutional fundraiser that was actually a fundraiser to subsidize the cost of Mitchell's visit. Only two donors, and the $90 tickets for the event, went toward the "fundraiser to talk about a fundraiser" as Executive Director Jim Rollings (and personal friend of Mitchell) described it.

Although the museum is undergoing renovation, and one might believe that was what the alleged fundraiser was for, this was just one of five presentations where Mitchell shared his moon trip, his UFO conspiracy theories, and his discredited parapsychology "research."

Conflict of interest and misleading events aside, this is no isolated incident.

The Roanoke museum and Virginia Tech University aren't the only institutions sponsoring pseudoscience creep. Dr. Paul Kortenaar of SciWorks Museum in Winston-Salem, North Carolina, told me that "pseudoscience in science museums and even in universities is a constantly growing epidemic," yet his own museum hosted a Science of Paranormal Investigating event.

"They are simply renting the venue," education coordinator Kelly Isenhour told the single member who complained, offering that, "SciWorks is receiving money for the event, if that makes you feel any better."

No, it really doesn't make anyone feel better that the science museum will allow pseudoscience the credibility of the museum for a price. Because that member complained, the museum has now renamed the event Paranormal Investigation and added a disclaimer that SciWorks doesn't endorse the event as science, and it is provided solely as entertainment.

Skeptics around the United States have reported finding pseudoscience souvenirs in their science museums. The Greensboro Science Center in North Carolina has hematite bracelets for sale to "heal your mind, body, and spirit." Tim Crookham found energy necklaces in his Dallas Perot Museum. The otherwise stellar Florida Natural History Museum also had "energy healing" bracelets.

Similarly allowing pseudoscience creep, schools, such as Bayport-Bluepoint High School in New York, have fundraised for STEM education by hosting psychics.

The American Alliance of Museums was contacted but did not comment on the situations mentioned, individual or general.

Pseudoscience is rampant in museums and schools across the United States, and unfortunately the media and likewise the public don't seem to care.

Jessie Haynes is a freelance science writer who focuses on instigating scientific literacy and investigating pseudoscience creep. Her portfolio and projects can be found at scijourno.com.

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Doubtful News Skeptical Roundup

It was a busy year at Doubtful News (http://doubtfulnews.com), where we chronicled 364 days (we take April Fools' Day off) of questionable claims about the paranormal, pseudoscience, anomalies, and alternative medicine to name just a few categories. Several stories reached high on the public's attention meters and rang the skeptical bell. Here is a sample of the top stories of 2013.

The end of Sylvia Browne: One of the world's most popular self-styled psychics celebrated her fiftieth anniversary tour in 2012, and it was all downhill from there. She received a tremendous amount of bad press after Amanda Berry was found alive after being held captive in Ohio. In 2004, Browne had told Berry's mother on the *Montel Williams* TV show that her daughter was dead. The mother died thinking her daughter was not alive. Sylvia, seventy-six and not in good health, never recovered from this career blow, dying on November 20. (See p. 7 in this issue).

Alternative cancer doctor Stanislaw Burzynski under fire: Thanks to several skeptical activists who kept up the pressure in the media, Burzynski, who offers an unproven, potentially harmful, and expensive chemical therapy called antineoplastons, was repeatedly exposed for shoddy practices and federal violations. The U.S. Food and Drug Administration is continuing its oversight of his work. We can hope this will be the end of his empty promises for a miracle cure that doesn't exist but sure costs a lot. (See special articles, p. 36, in this issue.)

Fake bomb detector trials: Skeptical activism also played a role in the media exposure of fake bomb-detection devices sold internationally. In 2013, two men who sold these devices were put on trial and found guilty. James McCormick was sentenced by a U.K. judge to ten years in prison for selling this worthless dowsing-like device known by various names such as the ADE 651 and Quadro Tracker. He lost his appeal of the sentence. Former associate of McCormick, Gary Bolton, who sold similar devices, received a seven-year sentence in a separate proceeding. (See the News and Comment story, SI, July/August 2013.)

Assassination of Dabholkar: Anti-superstition advocate Narendra Dabholkar was shot and killed in India in August. Dabholkar had been a physician and founded the Maharashtra Rationalist Association in 1989. He dedicated the rest of his life to his work to combat irrationality. The legislation he advocated to protect against superstitious fraudsters was rushed through in his state of Maharashtra, and other states are considering similar legislation. His killers have not been found. (See Special Reports by Ryan Shaffer and Bhaskar Sripada in the January/February 2014 issue of SI.)

Two spontaneous combustion cases: A man in Oklahoma and an infant in India were the focus of media attention as potential victims of spontaneous human combustion. The former, who was later found to have died of a heart attack, was a known smoker and alcoholic. The baby, who survived, was subjected to tests in an Indian hospital. Finally, an inquiry into potential child abuse was opened as there is zero evidence or mechanism for humans to combust internally or catch on fire without an external source.

Not a happy time at Loch Ness: Various interests went at each other's throats this year on the shores of the famous Scottish lake over the explanation for the mythical monster. A hoaxed photo by tour boat captain George Edwards was identified as a television show prop by another researcher. Edwards was unrepentant, taking the position that too many researchers were announcing there wasn't really a monster around. "No one will come to see a big fish." The local business commission was in disarray as they struggled with how to maintain tourism to the site while considering the genuine, non-monstrous explanations for Nessie.

Bigfoot DNA: Two researchers anchored both ends of the respectability spectrum in their work regarding supposed Bigfoot DNA. Veterinarian Melba Ketchum self-published a paper claiming her DNA sequences revealed that the North American Sasquatch was a hybrid human-unknown primate. Her findings were roundly dismissed. Meanwhile, Bryan Sykes, geneticist at Oxford University, made an unexpected finding from his supposed Yeti DNA samples in Asia: a hybrid Himalayan-polar bear. He came up with common animals for the American sample results, contrary to Ketchum's work. His work was disappointing to Sasquatch researchers but was ultimately accepted as valid. They vow to continue trying to find Bigfoot. (See my Special Report, SI, May/June 2013.)

TED talks not worth spreading: The popular conference series TED (Technology, Entertainment, Design) faced heated online debate when multiple outlets of their independent series, TEDx, were accused of hosting less than credible speakers at their events. TED headquarters warned affiliates back in 2012 to make sure their speakers were vetted and of high quality. Talks given at TEDx events by Rupert Sheldrake (about science dogma) and by alternative historian Graham Hancock, both of which were cited by complainants as containing factual errors as well as bad science, were removed from the main TED page. They remained available in other locations. Both men along with paranormal advocates protested the decision while scientific proponents defended it.

Conjuring up more popularity for demons: The horror thriller *The Conjuring* did well at the movie box office this year, continuing a trend for popularizing demonic possession as an actual condition. The movie was a boost to the reputations of Ed and Lorraine Warren, who were portrayed in the "based on a true event" story. Lorraine was guest of honor at screening events where she continued her allegations that demons are the cause of many hauntings and that only God can save you. The media failed to be critical of the basis of the movie and of the Warrens' history as less than credible authors and investigators of the paranormal. Even the newly installed Pope Francis created a stir when he did an impromptu exorcism in public. The church is reportedly deluged with cases of people claiming they need exorcisms.

People who lived in the house where the events depicted in *The Conjuring* supposedly took place were deluged with tourists and trespassers much like the famous Amityville Horror house was after the movie made it an iconic location. Several cases came up this year of trouble trying to sell "stigmatized" real estate. For example, actress/singer Olivia Newton-John found herself in a bind when the deal to sell her vacation home fell through because a building contractor committed suicide in the house. Real estate laws vary, but in some places the agents must disclose an event that occurred at that location that may result in "negative vibes" or a potential that it may be perceived as cursed or haunted.

What Kevin Trudeau doesn't want you to know about: Serial consumer scammer Kevin Trudeau was sent to prison after failing to pay fines based on his previous court settlements and for violating rules set by the Federal Communication Commission regarding false claims. The U.S. government is still trying to confiscate his assets to no avail, as he has apparently hidden them well. He is a prime example of what we call an "unsinkable rubber duck." He just keeps popping back up everywhere.

What will 2014 bring? Who can say? Although I'm not psychic, I can assure you there will be no shortage of questionable claims and pseudoscientific nonsense to examine.

Sharon Hill runs the critical thinking website DoubtfulNews.com and is a Scientific and Technical Consultant for the Committee for Skeptical Inquiry.

Body Parts Stolen from African Hospital for Magic Use

Benjamin Radford

The second-largest hospital in the southern African country of Swaziland was accused in October 2013 of operating a black market in human body parts used in magic spells.

The organ trade at Raleigh Fitkin Memorial Hospital in the city of Manzini has been described as an "open secret" by critics such as Reverend Grace Masilela. The hospital is a place where people from neighboring South Africa are said to come to buy bones, hearts, brains, and other organs. These body parts are often ground up and combined with roots, herbs, seawater, animal parts, and other ingredients by traditional healers or witch doctors preparing potions and spells for their clients. Sometimes the mixture is eaten or rubbed on the skin or into open wounds. The practice of using body parts for magical ritual or benefit is called *muti*—a Zulu word meaning "medicine."

NEWSCOM

Over the last three years people with albinism have been threatened by an alarming increase in the criminal trade of albino body parts. At least fifty-three albinos have been killed since 2007, some as young as six months old. Benedicte Desrus/Sipa USA/Newscom

Muti murders are different from ritual or sacrificial killings in that the goal is not necessarily the death of the victim (though that often happens from shock and blood loss), but instead obtaining body parts. Just as different ingredients in a recipe are used for different purposes, different body parts are used for different goals.

A 2010 Gallup poll found belief in magic widespread throughout sub-Saharan Africa, with over half of the respondents saying they personally believe in witchcraft and magic. Gérard Labuschagne, of the South African Police Service's Investigative Psychology Unit, has investigated dozens of muti murders. Writing in the January 2004 *Journal of Investigative Psychology and Offender Profiling*, Labuschagne explains the underlying belief system of muti:

> In traditional African beliefs it is assumed that there is only a certain amount of luck in society. Each individual receives a portion of that luck. It is therefore believed that if another person is successful, then they have obtained an extra portion of luck via devious means, usually with the intervention of the supernatural. . . . Setbacks or calamities, such as drought or illness, are signs that the natural and social order have been disturbed. One means of obtaining this extra portion of luck or restoring the natural order is through the use of strong muti. It is with this strong muti that muti murders are often associated. Muti made from human body parts is considered to be exceptionally powerful.

Muti murders are different from ritual or sacrificial killings in that the goal is not necessarily the death of the victim (though that often happens from shock and blood loss), but instead obtaining body parts. Just as different ingredients in a recipe are used for different purposes, different body parts are used for different goals. For example, eyes may be stolen and used in a magic ritual to help restore a client's failing eyesight, while severed hands will assure business success, and genitals are believed to attract luck. In some cases criminals have been arrested during robberies with muti in their pockets, having been told by a healer that the body-parts medicine would make them invisible to police—or even bulletproof.

Body parts from live victims are said to be the most powerful, though organs taken from the dead are sometimes used, as is claimed to have happened in Swaziland. Labuschagne notes that "there seems to be an increase in grave robbing where the body parts removed are similar to those used in muti. Also, theft or sale of body parts from hospitals and mortuaries has occurred. It is uncertain whether or not the traditional healer would be able to tell if a body part is removed pre- or post-mortem."

Stealing organs from the dead for use in magic spells is a ghastly crime, but at least the unwilling donors are deceased. Just as often, murderers working on behalf of witch doctors attack and kill innocent people for their body parts. Muti murders are particularly brutal, with

knives, machetes, or even glass shards being used to cut and hack off limbs, breasts, and other body parts from their victims—including children. In East Africa, at least fifty albinos (people with a rare genetic disorder that leaves the skin, hair, and eyes without pigment) were murdered for their body parts in 2009, according to the Red Cross. An albino's arms, fingers, genitals, ears, and blood are highly prized for their especially powerful magic.

Muti murders have occurred throughout South Africa, and especially in rural areas. Reliable figures on the number of muti murders there are elusive because police do not track those murders separately from other homicides, but estimates range from a few dozen to a few hundred per year. Science fiction fans may recall that muti was featured in the hit South African film *District 9*, in which the hero's body parts were sought after by a local warlord who believed that the limbs would give him magical powers. Most Africans, and most traditional healers there, reject muti murder and don't engage in the practice. Still, the belief that body parts can be used in magic rituals has been a part of African belief for centuries, and it will likely remain so.

Benjamin Radford is the deputy editor of the Skeptical Inquirer.

C.E.M. Hansel (1917–2011), Early Scientific Critic of Parapsychology

James Alcock

We have recently learned of the death of C.E.M. (Mark) Hansel (1917–2011), a Fellow of the Committee for Skeptical Inquiry and one of the first major critics of parapsychological research. Charles Edward Mark Hansel was born in Bedford, England, and attended school there. Then, as the clouds of war gathered over Britain, he joined the Royal Air Force in 1938, where he became first a pilot and then a squadron leader. After demobilization in 1946, he studied psychology at Cambridge University and earned a Masters of Arts degree. In 1949, he was made lecturer in psychology at the University of Manchester, where he taught until 1965 when he was appointed as the first Chair of Psychology at the University College of Swansea, Wales. He remained in that position until his retirement.

His primary research interests were focused on visual perception, and he was an authority on the physiological and psychological aspects of color vision. He published a number of papers dealing with the *kappa effect*, a temporal perceptual illusion in which the perception of elapsed time between two successive stimuli is affected by the physical distance between the stimuli. He also carried out research into decision-making and subjective probability, and he coauthored an important book on the subject, *Risk and Gambling* (1956). In addition to his academic achievements, he was an accomplished violinist and for a number of years played first violin in the Alderley Edge Orchestra.

The book for which he is best known, *ESP: A Scientific Evaluation*, was published in 1966, at a time when there was a severe paucity of critical literature on the subject of parapsychology. (An updated version, *ESP and Parapsychology: A Critical Evaluation*, was published in 1980.) By the early 1960s, Joseph Banks Rhine and his colleagues at Duke University had published extensively on their research into extrasensory perception (ESP) and psychokinesis, arguing that they had scientifically established the reality of paranormal phenomena. Although Hansel accepted that one cannot rule paranormal phenomena to be *a priori* impossible, he argued that such phenomena are so contrary to what we know about brain function, human perception, and the way that things work in the physical world that they are more reasonably explained in terms of coincidence, methodological error, and trickery.

Although several prominent psychologists had responded as armchair critics to the burgeoning parapsychological literature, Hansel set an important example by going to Duke University and examining the actual settings in which a number of important experiments had been conducted. He reported that each of the experimental settings he examined had presented opportunities for trickery, leading him to conclude that cheating could not be ruled out, thereby gainsaying the claim that ESP and psychokinesis had been scientifically established. Indeed, he went further, pulling no punches: He concluded that parapsychology had not only failed to produce scientific evidence for supernatural phenomena but that its history was largely one of fraud, imposture, and crass stupidity.

Yet he garnered criticism for his selective focus. On the basis of having found ways in which trickery or error might have occurred in the small number of experiments that he did examine—experiments that were not always the best examples that parapsychology could offer—he dismissed the claims of parapsychologists in general, all the while ignoring the larger body of research that they had produced.

However, it must be remembered that prior to the founding of the Committee for the Scientific Investigation of Claims of the Paranormal in 1976, very little informed criticism of parapsychology had been published, and it is in this context that the importance of Hansel's contribution, as one of the first major critics of parapsychology, must be judged. Both because of his early efforts to interact with parapsychologists and examine their research settings, and because of the very significant impact that his book has had in motivating the many skeptical researchers who have followed, the skeptical movement is in his debt. For that, he deserves a special place in its history.

James Alcock is professor of psychology at Glendon College, York University, Toronto, and a Fellow and member of the Executive Council of the Committee for Skeptical Inquiry.

cfi | SUMMIT

Skeptics, Humanists Come Together in Tacoma in First Joint Conference

Skepticism, Humanism, or Both?

It was billed as the CFI Summit—An International Congress in the Pacific Northwest, and it was a kind of experiment. "The time has come: humanists, skeptics, and other critical thinkers coming together to work together for a more rational world." That was the meeting's call to action, as the first joint conference of the Center for Inquiry and its affiliate organizations, the Committee for Skeptical Inquiry (CSI, publisher of the Skeptical Inquirer) and the Council for Secular Humanism (CSH, publisher of Free Inquiry), convened in a stylish, modernist hotel in Tacoma, Washington, October 24–27, 2013. The conference thus included/subsumed what otherwise CSI would have called CSICon 3, following the first CSICon in New Orleans in 2011 and CSICon 2 in Nashville in 2012.

The weather outside was foggy, though the talk inside was anything but, as skeptic and humanist speakers explored all the areas in which their interests and passions overlap, and a few that some may (and others may not) wish to keep separate.

We offer two reports. SI Editor Kendrick Frazier highlights several representative sessions[1] that may be of particular interest to SI readers, and skeptic Susan Gerbic offers a more personal, impressionistic account of the conference.

Highlights

KENDRICK FRAZIER

The opening plenary session, "Humanism, Skepticism, and Inquiry," was a theme of much of the conference and the point of continuing discussion throughout. Is it about time the two major arms of the Center for Inquiry—skeptics with their love of science and evidence-based inquiry and humanists with their naturalistic philosophy and distrust of religious intrusions in public life—come together, at least once a year, in a conference like this? Or are there still good reasons that the two groups keep their own separate conferences?

If you drew two circles representing the interests and values of members of the two groups, they'd probably overlap by about two-thirds or three-fourths. But the overlap isn't total. Philosopher Paul Kurtz, who founded CSI and CSH, considered both organizations and their missions equally important.

Brian Engler

Panelists in the opening session on "Humanism, Skepticism, and Inquiry" take questions.

Yet while he himself embraced all their values and goals in one overarching personal philosophy, he, for various practical reasons, including the wishes of many members, kept the two organizations and their conferences separate, with the later-created Center for Inquiry as mainly a logistical and administrative connective.

Ronald A. Lindsay, now the CEO and president of all three organizations, opened the plenary session with an explication of what they all have in common: a commitment to critical thinking and a conviction that beliefs should not outstrip the evidence. He suggested that there are no irreconcilable differences between skepticism and humanism. "They are compatible. . . .We need to examine all things carefully and go where the evidence takes us. That unifies us."

Ray Hyman and Daniel Loxton

took a contrary view. Hyman, a founding Fellow of CSICOP (now CSI), said, "The real problem is the perception." He referred to a sometimes "uneasy tension" between the skeptics and humanists and an early concern in the organizations' histories in which skeptics became upset at what they considered "religion bashing" by some humanists and some humanists became upset at what they considered skeptics' bashing of parapsychology. In Hyman's recollection this led to Kurtz's determination to keep the two groups' conferences separate. Hyman also noted that in the skeptic movement a lot of people can be at least somewhat religious and still good scientific skeptics. "Skeptics are more inclusive by nature," he said. "It's probably not a good idea to mix these two groups."

Lindsay quickly emphasized—as did CFI Board Chairman Edward Tabash later in the conference—that CFI doesn't "bash" religion but examines it. It emphasizes that religion should not have a privileged place in society exempt from critical scrutiny.

Loxton, though, echoed Hyman's theme. Loxton, editor of the Skeptic Society's *Junior Skeptic* and author of several books (including some on evolution), has become a kind of informal historian of the skeptic movement. He says he feels intimately connected to both traditions, skeptic and humanist (he is both). Nevertheless, said Loxton, "I am a CSICOP-style skeptic" and noted that the creation of CSICOP filled a large gap in scholarship. "I care about keeping scientific skepticism unencumbered and independent," he said. "It doesn't matter what we believe. The question is what we can demonstrate to be so. Skepticism matters."

Barry Kosmin, founding member of the Institute for the Study of Secularism in Society and Culture at Trinity College (and a board member of all three organizations) described what he calls "The Rising Secular-Skeptic Generation," based on his national surveys of college students (the latest this summer carried out in collaboration with CFI). The 2013 survey found that only 32 percent of college students self-describe themselves as religious. Twenty-eight percent refer to themselves as secular (males more prominent in this group) and 32 percent as spiritual (females more prominent). His point is that "a large constituency of millions of young people is emerging" favorable to the viewpoints of CFI.

Michael De Dora, director of CFI's Office of Public Policy in Washington, DC, said he thinks skeptics and humanists can work best together. They have complementary values on many issues, he said. He agreed that CFI presents a bit of a challenge because it is a "mish-mash" of many things, but that can be overcome.

Brian Engler

Michael De Dora, director of CFI's Office of Public Policy in Washington, D.C.

Some other panelists, like Ophelia Benson (an author and *Free Inquiry* columnist) and Mark Hatcher (CFO of Black Atheists of America) expressed impatience with the whole debate. Instead of emphasizing this internal issue, Hatcher urged focusing on a far bigger, external problem, endemic to both groups: "We are terrible at communication." He said both humanists and skeptics need to take a lesson from the churches. "Churches do things correctly as far as communications. They have found the beat. They have found the rhythm and how the heart works. If you want people engaged, you've got to get your finger on the beat. If we do, we have the advantage of actually having facts."

Bill Cooke, director of CFI's transnational programs, also spoke out with some impatience. In Kenya and Uganda, where he has worked on behalf of CFI, "there are serious issues of life and death" that involve both parts of the organization, including the skeptic side, such as belief in witchcraft that often leads to murders. "There this issue is irrelevant."

The discussions continued a while longer in this way, all polite and civil. If any fireworks were expected, none were set off. By conference-end, it seemed most everyone, skeptic or humanist, had learned a little bit about the other's concerns, and in fact found that their issues tended to blend one in to another in a more or less seamless way.

By conference-end, it seemed most everyone, skeptic or humanist, had learned a little bit about the other's concerns.

Zack Kopplin, Young Education Activist

Zack Kopplin is the amazingly dedicated and self-possessed college student from Rice University who as a high school student in Louisiana fought vigorously against efforts to introduce creationist teachings into the schools. He gave an inspiring lecture about his fight for science in Louisiana, Texas, and across the country.

"Louisiana has an addiction to creationism," he said. The state's Science

Education Act "is so open-ended you can bring anything into it. . . . It's not about critical thinking. It's really a creationism law." Even Governor Bobby Jindal has said it's about creationism, Kopplin said. "It's crystal clear this is only about teaching creationism."

In Texas, official reviewers of science textbooks include fellows of the creationist Discovery Institute and the Institute for Creation Research. "The publishers have resisted so far," said Kopplin, but he wasn't sure whether their resistance would continue to succeed.

The problem in both states is "backwards, antiscience legislators." Louisiana passed a voucher system that takes money from the public schools and gives it to creationist schools. He said $4 million of public money was taken away that way the first year.

"I want scientists who have been educated well," Kopplin concluded. As for the sometimes nasty attacks he has encountered from creationists, he has endured them, "but sometimes you want to just go to sleep for a week."

Brian Engler
Bill Nye delivers the summit's keynote talk.

Bill Nye, 'The Science Guy'

At the evening banquet, conference attendees filled the round dinner tables. Looming at the back were four empty rows of folding chairs spanning the entire width of the ballroom. A bad sign? No, as it turned out. As dinner ended and the time neared for Bill Nye's keynote talk, suddenly the doors at the back opened and in rushed an exuberant crowd of mostly local people, including a fair number of youngsters. The talk had been advertised on the sides of city buses, and outside the banquet hall CFI sold tickets for just his talk. (He was still in a leg brace from his *Dancing with the Stars* appearances, and it was now just a few days before his November 7 appearance on a typically witty episode of the CBS television comedy *The Big Bang Theory* pitting Bill Nye "The Science Guy" against Bob Newhart as "Dr. Proton.")

Nye's was a rousing talk, roaming over how we determined the age of the Earth at 4.6 billion years ("Why then try to pretend the Earth is 10,000 years old? Amazing!"), the makeup of the universe ("90 percent hydrogen, 8 percent helium, 2 percent 'everything-elsium'"), the fragility of the atmosphere, our spacecraft now soaring on beyond the edge of the solar system, and some of our external views of Earth from distant space. All this led to a passionate advocacy for interest in science and science education. And that led in turn to Nye's frequently repeated mantra: "We can change the world!" By midway through his talk the audience was thoroughly with him. Their chants "We can change the world" reverberated along with his.

Example: "If we can harness the energy of young people and get them passionate about science, it is reasonable to think that we can . . . change the world!"

"It is with great joy and reverence and passion that I talk about the impact of science education." He ended by showing the Cassini spacecraft's new view of Earth from beyond Saturn as a tiny dot barely visible in the distance far past Saturn's rings, an outside-in view of the solar system that provides sobering cosmic perspective. "We are a speck on a speck, orbiting a speck." But by our experiencing "the passion and joy and beauty of science . . . we can change the world!"

Nye's frequently repeated mantra: "We can change the world!" By midway through his talk the audience was thoroughly with him. Their chants "We can change the world" reverberated along with his.

There followed an especially lively Q&A period. Most all the questions came from the newly arrived audience members, and two nearly moved Bill Nye to tears by their stories of how he has inspired them to pursue a lifetime interest in science. Said one person: "You have been a major influence to me personally. Thank you for being who you are."

"I have tried to influence young people," Nye said. "The scientific method is the best idea humans ever had."

It should be easy to draw people in, he added, because science deals with some of humanity's most profound questions. Among them: "Where did we come from?" and "Are we alone?"

"We are made of stars," he concluded. "If that doesn't fill you with some sort of joy . . . I don't believe it!"

Leonard Mlodinow and New *Point of Inquiry* Hosts

Physicist and writer Leonard Mlodinow (author of *The Drunkard's Walk*: *How Randomness Rules Our Lives*, winner of CSI's 2008 Balles Prize for critical thinking) gave a lecture presentation on the topic of his new book, *Subliminal: How Your Mind Rules Your Behavior.* He presented recent research from cognitive psychology and the new field of social neuroscience about the automatic aspects of our consciousness, which happen without our awareness or intention.

"Our perceptions, memories, and social judgments are all constructed by our unconscious, from limited data," said Mlodinow. Even with just perception, it is a process of construction. "Your retina sees things fuzzily and incomplete"—he showed examples from experiments. "Your brain sharpens and fills in. Your unconscious mind does this for you, and it's a great gift."

This happens with hearing as well. He played the Led Zeppelin song "Stairway to Heaven" backward. You seem to hear "Satan" three times and also "666"—if that is suggested to you. Similar things happen with all our other senses (experiments show how a light touch can create a sense of trust and even lead to higher tips to waitresses). Memory is of course a reconstructive process as well. "Just like vision, your brain takes the gist of memory and reconstructs it. "

Brian Engler

Josh Zepps interviews Leonard Mlodinow on a live edition of *Point of Inquiry*.

He described how we all do what psychologists call motivated reasoning. "We look for data that supports what we want to believe." This explains why people can come to vastly different judgments even when the factual evidence before them is the same. "They've generally sincerely judged the evidence differently—it's unconscious."

Mlodinow described how we all do what psychologists call motivated reasoning. "We look for data that supports what we want to believe." This explains why people can come to vastly different judgments even when the factual evidence before them is the same.

Brian Engler

The new *Point of Inquiry* team: Lindsay Beyerstein, producer Joshua Billingsley, and Josh Zepps.

Laboratory tests show these processes in various ways. Experiments, for example, show that in elections, seventy percent of the candidates judged to be "more competent looking" won.

At the end of that afternoon, Mlodinow was back on stage. The occasion this time was the first interview (and before a large live audience) with the new cohosts of CFI's weekly *Point of Inquiry* podcast, Josh Zepps and Lindsay Beyerstein. An Australian, Zepps joins the CFI podcast as a founding host and producer at online talk network *HuffPost Live*, after hosting stints with Bloomberg TV, the Discovery Channel, and as anchor for CBS's Peabody Award–winning Channel One News. Zepps conducted the interview with Mlodinow, who got the chance to expand some about the fact that most of our thinking comes from the unconscious and about motivated reasoning ("thinking like a lawyer, not a scientist.")

The other cohost, Lindsay Beyerstein, is an investigative journalist and staff writer for *In These Times.* Longtime SI readers will remember her late father, psychologist and CSI Fellow and Executive Council member Barry Beyerstein. She interviewed conference lunch speaker Katherine Stewart (author of *The Good News Club: The Christian Right's Stealth Assault on America's Children*) on religious extremism and how the Christian right has managed to gain so much influence actually operating in public schools. These two interviews are online at www.pointofinquiry.org.

Note

1. Noteworthy skeptic-related sessions I've not reported on here include Eugenie C. Scott's lecture presentation on science education, "Keeping the Good Stuff In"; Scott Lilienfeld's lecture presentation on the subject of his book *Brainwashed: The Seductive Appeal of Mindless Neuroscience* (topic of our November/December 2013 cover article); the pre-conference Skeptics Mini-Toolbox workshop (Ray Hyman, Harriet Hall, and Loren Pankratz); and a Skeptical Breakout session I moderated on "Skeptical Investigation and Activism" (Joe Nickell, Benjamin Radford, James Underdown, and Susan Gerbic).

Kendrick Frazier is editor of the SKEPTICAL INQUIRER.

Impressions

SUSAN GERBIC

Back from the CFI Summit, I am completely impressed. Not only was there no obvious twerking, but there was no drama, and in our tight little community of scientific skeptics that is a wonderful thing. I will say very little here about the lectures, as I didn't really attend them. My agenda was not passive; I went to network and recruit people to join my Skeptic Action and GSoW projects (Guerilla Skepticism on Wikipedia, see SI Interview, March/April 2012).

The Summit was the same week as Halloween. For years now I have been saying I will dress up "next year," and when that year arrives it doesn't seem to happen. Now I'm bald from the chemo killing my breast cancer and felt that finally "next year" was "this year." So I went all out: I changed costumes twice a day. Cleopatra, Medusa, Che Guevara, and many, many odd hats. For the costume party I was a phrenology dummy. Suzi Beyerstein, Jeanine DeNorma, and Herb Masters had the honor of drawing the wonders of the brain all over my head in eyeliner. I took second prize (best skeptical costume, though). The cleverness from our community to come up with great skeptical costumes was really delightful.

I wasn't sure what my reception would be; since I was a speaker, should I reflect a more professional attitude? Well, it isn't every day you get a pass to blame everything on the chemo, so I just went with it, and no one cared. In fact it was extra wonderful. CFI was more than helpful—Wi-Fi, food, electricity at a free table. The general attendees loved the outfits and hats. All day, every day people came over to talk about what I was wearing. The mood was great; so many people were attending their first skeptic/humanist conference, and they were excited to be able to see fun like-minded people who wanted to meet them also. Not only was this happening in their backyard (the Pacific Northwest), but the quality of the speakers, great food, Wi-Fi, and tables in the lecture room really spoiled them. The Hotel Murano was a lovely place, glass art everywhere, just like staying in an art museum.

My goal was to hang out with attendees, network, photograph, and recruit. I was also able to spend quality time with many people teaching them how to use Web of Trust and Rbutr and to edit Wikipedia for skeptical activism, which is my specialty. Because of my unique position, I was able to listen, observe, and talk about the event with lots of people. Now, after some reflection, I would like to share my opinion on the big question organizations like CFI want an answer to.

Susan Gerbic gives activism instruction to Jeff and Jon Taylor-Kantz, Suzi Beyerstein, and Ray Hyman. (Photo by James Underdown)

Back from the CFI Summit, I am completely impressed. Not only was there no obvious twerking, but there was no drama, and in our tight little community of scientific skeptics that is a wonderful thing.

In many quarters there seems to be an attitude that humanism and skepticism should be kept separate. We are too different and don't understand why "they" would be interested in what they are doing, when what "we" are doing is so much more important. The general opinions are that skeptics are naysayers and "Bigfoot skeptics." All that nonsense has been long ago debunked so why should anyone care anymore? And humanists (also called atheists) are too focused on social issues, don't follow the scientific method, and believe all kinds of antiscience things (Bill Maher is an example).

The theme of the CFI Summit this year was to open this debate and hope to come up with some kind of answer. After all, times are tough, we have to watch our dollars, and if thousands were attending these conferences and all seats were filled, then I'm sure the separate conferences would happen.

The initial opinion from the skeptics, that the humanists were not interested in scientific skepticism and that they held antiscience opinions, was unfounded. I never once heard a humanist with this opinion. They seemed just as interested in psychics and medical quackery as any skeptic.

competing workshops, one on "Atheism and Naturalism" and the other on a "Skeptic's Toolbox." On Friday I was part of a panel that discussed investigation and activism, while in a different area the humanists discussed measuring unbelief. The rest of the conference we all met together in one big room with various topics, scientific as well as humanist.

Here is what I discovered. The initial opinion from the skeptics, that the humanists were not interested in scientific skepticism and that they held antiscience opinions, was unfounded. I never once heard a humanist with this opinion. They seemed just as interested in psychics and medical quackery as any skeptic. And while the skeptics might have felt a bit hurt that there were more antireligion type lectures at the conference, they were happy to join in the conversations once they attended, the exception being when the lecture seemed angry or ranting about religion. Some of the lectures were difficult to decide what camp they fell into. Eugenie Scott and Zack Kopplin's lectures about creationism in the classroom and legislature were common ground. Katherine Stewart's research into the Good News Clubs in America was also gripping for both groups. There were also lectures discussing legislation as well as psychology of belief, important topics to understanding what we are up against. Topics like creationism in the schools and antiscience medical claims hit home to both camps.

Many good points were made, one of which is that on college campuses today, atheism is hot, and we should be emphasizing this while they are interested. Another point made was that sometimes more doors will open when we are focused on science and not religion. Schools are more likely to allow in a skeptic group than an antireligion one. Debbie Goddard stated the obvious when we were discussing leaving CFI magazines in public places for people to find. She said she suspects that more people are likely to pick up a magazine on ghosts or vampires to

Jeanine DeNorma and Suzi Beyerstein turn Susan into a phrenology dummy for the Halloween costume contest. (Photo by Herb Masters)

Learn to edit Wikipedia with Medusa. (Photo by Brian Engler)

We could even throw conferences focused on specific topics like UFOs, atheism, medical quacks, and so on, but at the moment we don't have that luxury. So how do we best spend our conference dollars?

Clearly, I did hear lots of people (usually first time conference attendees) state that they were attending an atheist conference. Some people said they were telling their families that they were attending a science conference, because I suppose they wanted to avoid backlash. For two hours on Thursday there were

browse through, than an issue devoted to humanism. Possibly it is just easier to use science and skepticism to start the discussion with people. And that is what we are trying to do after all: start a discussion.

I've learned that some churches are using cryptozoology as real to disprove evolution. What happens to that theory when the child looks up Nessie on Wikipedia and discovers that Mom and Dad have that all wrong, and find that "Evidence of its existence is anecdotal"? Followed with plenty of citations that child can follow to the investigations and evidence our skeptic community has left there for them to find? This is why people start questioning their religion, small questions that start a snowball of questions. This is what happened to me. But didn't I say earlier that people aren't interested in Bigfoot skepticism? Someone should tell the 87,841 people who visited the Loch Ness page last month that no one cares about that stuff anymore.

I totally understand that religion is hot news right now. (When has it not been lately?) It seems like you can almost draw a line from most social problems back to people's unquestioning belief in something that has no scientific basis to it. They cling and fight to hold tight those tenets. We have to find lots of ways to have these conversations. Brian Dunning from the *Skeptoid* podcast tells us that maybe the best way to have these uncomfortable discussions is to find a topic you both can agree on and work your way to the hot topic when you are ready. Talk about what evidence means, how to question something correctly, just keep talking and listening to each other.

On the thirty-minute van ride back to the airport I think the point was much clearer. Joe Nickell, Leonard Tramiel, and I totally engaged the four strangers also traveling with us. We had great conversations about Bigfoot and UFOs and what evidence means. They were thrilled to hear stories about Bill Nye and Neil deGrasse Tyson. We were the cool kids in that van, and when the city bus rolled by with Bill Nye and the CFI Summit advertisement on it we were beyond the cool club. One woman said, "I wanna hang out with you guys." I suspect we would not have had the same reception if we were talking about religion. Yet, if we had the time, the conversation might have gone in that direction. And they would have been more receptive to it if done in that order.

Can we find common ground in our community? Should we combine conferences at least until the time we have grown so large we are holding them in mega-church halls? My opinion is that we have to work together. We overlap so much and we are such a small community in comparison to others.

So back to CFI's theme this year. Can we find common ground in our community? Should we combine conferences at least until the time we have grown so large we are holding them in mega-church halls? My opinion is that we have to work together. We overlap so much and we are such a small community in comparison to others. We need to find a way to respect each other's passions, and talk to each other, not tweet at each other when we have a complaint. Face-to-face contact at these conferences is very important. The networking, training, and bouncing of ideas off each other is what is needed. Yes, we have to continue to grow and grow and grow. But first we need to start thinking of ways to stay together and find the common ground. Then maybe we can start making more efficient progress.

Yes, conferences might lose money. It's difficult to find the right formula in the right location at the right time of the year. And what works this year might not the next. I doubt we are clever enough to figure it out. What I do know is that the one-on-one contact recharges our batteries. People like Harriet Hall (Skepdoc), Lindsay Beyerstein (cohost of *Point of Inquiry*), and myself came from CSI's Skeptic's Toolbox. We weren't primarily authors or lecturers, just people with a passion for the skeptical movement who decided it was our turn to step up. You can't buy that fire, but sometimes you might have to kick the embers to keep us (and others) out there fighting what seems to be an insurmountable world of woo. Conferences are essential.

Oh yeah, a couple more things, at the end of every lecture the same question came up. What can I do to help? The main answer we heard was "give money." Very little happens without money; apparently it is pretty powerful. Besides that, pay attention to your local elections, especially school boards where your vote can make a big difference. And the most obvious activism advice was to follow Skeptic Action on Facebook, Twitter, or Google+ and join the GSoW team. ■

Susan Gerbic is cofounder of the Monterey County Skeptics, a member of the Independent Investigations Group (IIG), and a self-proclaimed skeptical junkie. She is also founder of the "Guerilla Skepticism on Wikipedia," "We Got Your Wiki Back!," "Skeptic Love," and "World Wikipedia" projects.

Eugenie C. Scott Given CFI/CSI Lifetime Achievement Award

Here are the remarks by CFI President and CEO Ronald A. Lindsay at the CFI Summit in Tacoma presenting the organization's Lifetime Achievement Award to Eugenie C. Scott.

RONALD A. LINDSAY

Where would we be without Eugenie Scott?

This is a serious question. The struggle for the integrity of science education in the United States, especially in regard to the teaching of evolution, has been a grueling slog, a war of attrition. Despite the fact that creationism is an outdated myth, evolution's opponents have been tenacious, determined, and even at times, clever. With every victory for science and reason, those who want religious indoctrination to be part of our public schools adapt, change their tactics, adjust their language and messaging, and, well, evolve to suit a changing environment.

In other words, no one political or legal win for science spells the end of the creationist assault on education. At least not so far. But we would be in a much worse position if not for Eugenie Scott.

Most of you know about the high profile victories. Perhaps most famously, Dr. Scott was instrumental in the win for science in the Dover Trial, in which intelligent design, a rickety Trojan Horse for creationism, was almost laughed out of the courtroom. But it was Dr. Scott and her team at the National Center for Science Education (NCSE) who mustered the intellectual and academic forces necessary to make such a nationally recognized victory for science possible. Not only did evolution win in a legal, technical sense, but what the judge called the "breathtaking inanity" of intelligent design was exposed for what it is. It was a pivotal event legally, but perhaps even more so, it was pivotal culturally.

And this is where Dr. Scott has proven truly indispensable. In every new case, in every bad bill in a state legislature, or backward curriculum from a creationist school board, the NCSE has not only brought to bear intellectual and scientific firepower, but in the person of Dr. Scott, science education has perhaps its greatest ambassador. In the media, in talks to audiences like this one, in court rooms, and person to person, she brings an enthusiasm for learning, a whip-smart sense of humor, an approachability that dispels stereotypes of scientists and secularists, and a generosity of spirit toward those with whom she disagrees. Eugenie Scott has been crucial for the cause of science education, and she is truly irreplaceable.

But, though irreplaceable, she is moving on. As many of you know, Dr. Scott will be stepping down from her position as executive director of NCSE at the end of this year, after a remarkable twenty-seven years on the job. Luckily for all of us, she leaves NCSE incredibly strong, nationally respected, and a formidable force for the integrity of science education in America.

So, it gives me great pleasure to present this Center for Inquiry and Committee for Skeptical Inquiry Lifetime Achievement Award to Dr. Eugenie C. Scott, "Champion of Evolution Education."

Nickell Presented Balles Prize

Joe Nickell, CSI's senior research fellow and prolific author of investigative books, was presented CSI's previously announced (SI, September/October 2013) Robert P. Balles Prize in Critical Thinking.

"It has been my great pleasure to have worked with Joe for several decades now . . . and I continue to be amazed, even awe-struck about his extraordinary investigative skills, deep knowledge, insight, scholariness, professionalism, fairness, and literary productivity," said CSI Executive Council member and Skeptical Inquirer Editor Kendrick Frazier in presenting Nickell his award. "Both in the quality and the quantity of his investigations and writings, he is a wonder, a true national treasure—international treasure really, because he investigates and is read everywhere he goes around the world—and one eminently deserving of this year's Robert P. Balles Prize."

[INVESTIGATIVE FILES JOE NICKELL

Joe Nickell is CSI's senior research fellow. A former stage magician, private investigator, scholar (PhD in English, with an emphasis on literary investigation and folklore), and forensic writer, he is the author of numerous books, including *The Science of Ghosts* (2012).

The Conjuring: Ghosts? Poltergeist? Demons?

The 2013 scary movie *The Conjuring* was very loosely based on the story of Roger and Carolyn Perron and their five daughters who moved into a "haunted" Rhode Island farmhouse in January 1971. There, hysteria soon reigned, the flames of which were fanned by the infamous paranormal "investigators" Ed and Lorraine Warren. Now the Perrons' oldest daughter Andrea is at work on a trilogy on the case called *House of Darkness House of Light* (Perron 2011, 2013).

Dramatis Personae

The Perrons—he of French Catholic descent, she part Cherokee—married in 1957. In short order they had five children. (Writes Andrea, "It's a Catholic thing" [I: 446].)

Roger Perron's work took him on long road trips, a fact that harmed his marriage (he and his wife eventually divorced) and kept him largely a stranger to his children. He was skeptical of most of the occult phenomena reported by the six others. Andrea Perron (I: 112, 195) characterizes the situation as her mother's integrity "being overtly challenged by disbelief, as though her opinion was entirely irrelevant, her recounting of events fraudulent." The girls were "squarely in her camp." (Roger eventually seemed to acquiesce, possibly to promote domestic harmony—something I have observed on occasion in my fieldwork.)

Carolyn Perron was highly impulsive. When she saw an ad for a colonial farmhouse at Harrisville, Rhode Island, she viewed the property and—without consulting Roger—made a down payment, even though they were strapped for cash. Effectively a lapsed Catholic, Carolyn became something of a New Ager. She "felt" and "sensed" various "presences" (e.g., I: 59, 63, 108), practiced dowsing for water (I: 146–147, 153), saw apparitions, and—once—seemed "possessed" (I: 156–159, 185; II: 355–363, 393). After one experience she developed a neck pain for which a doctor could find no physical basis (I: 355). She had fainting spells, typically in front of the fireplace and in Roger's presence, and he would rush to save her from the fire (I: 249, 278, 279).

Like mother like daughter. "Each of the girls developed a *real* emotional attachment to the spirits in the house," Andrea says casually (I: 454), "while bonding between dimensions."

Andrea (or Annie) was the Perrons' first child, born in 1958. No wallflower, when their previous house was vandalized and Andrea thought she knew who the culprit was, she pounced on the boy, pummeling him and breaking his nose. About three years later she was dismissed from a confirmation class when she had an "altercation" with the priest, challenging him about masturbation and homosexuality (I: 7–8, 260–261). Andrea sometimes saw "shadows" and heard voices (I: 192–193).

Nancy, the second daughter, was a "nine-year-old spitfire," explains Andrea (I: 25). When spirits began to appear to the new residents, Andrea says of her sister, "Competitive in every way, Nancy *had* to claim credit for the first official sighting" (I: 213). A girlfriend once accused her of faking poltergeist-type occurrences in her presence, but friendship prevailed as the girl reconsidered (I: 484–485). Odd things happened to Nancy. For example, once becoming lost on the way home by taking an unfamiliar trail, she encountered an apparitional "family" (I: 131). She and a girlfriend played with a Ouija board, whereupon, she said, "The spirits talk to us through it" (II: 293).

Christine (or Chrissy), Andrea insists, "developed supernatural skills acquired only through the use of a sixth sense" (I: 121). On one occasion,

"something wicked," says Andrea, "had rudely awakened Christine in the middle of the night." For months at a time, however, Chrissy would sleep undisturbed by "the presence" (I: 392–393).

The fourth child, Cynthia (or Cindy), "attracted supernatural activity unlike any of her siblings," and, Perron adds, had "passive/aggressive tendencies" (I: 431, 438). She reported multiple apparitional experiences (I: 73–74, 223; II: 69, 164); the receipt of "telepathic messages" (II: 2); an invisible entity coming to her aid (I: 314–315); and entering "another realm of the house, another dimension" (I: 434). Her bed, she claimed, vibrated at times and, when she was thirteen, "levitated," or at least rocked wildly once, while she screamed incessantly—although the rest of the family downstairs heard none of this (I: 435).

April, the youngest child, was only five, a preschooler, when the Perrons moved into the old farmhouse. April had what most people would call an imaginary friend. "Oliver" became her frequent "playmate," and their communication was "telepathic" (I: 454; II: 95–97). The "baby" at home, April watched "as her sisters begged for the same type of attention she received all day, every day" (I: 1). When she did go to school, her behavior landed her from time to time in "parochial purgatory"—detention.

Then there were Ed and Lorraine Warren—the demon-hunting duo—who visited the home a few times. They were *not* sought out by the Perrons, as *The Conjuring* portrays, but simply showed up there one day. That it was on a night "just prior to Halloween" (II: 258) is typical of the Warrens. Seeking publicity, their *modus operandi* was to arrive at a "haunted" house that they soon transformed into a "demonic" one, in keeping with their own medieval-style Catholic beliefs. Again and again they were attracted to the homes of Catholics: the Lutzes at Amityville, New York; the Smurls at West Pittston, Pennsylvania; the Snedekers at Southington, Connecticut. Coauthors of the Warrens' books have since indicated they were encouraged to fabricate elements to make the books "scary," and at least one such writer has effectively repudiated the book he wrote. I appeared with the Warrens on *Sally Jesse Raphael* for a pre-Halloween 1992 promotion of their book with the Snedekers, and found Ed Warren a belligerent, manipulative character (Nickell 2012, 281–286).

Ghostly apparitions and pranks reportedly assailed the Perrons from the outset, sparing only the father, Roger. I read accounts of many of their apparitional experiences with an old familiarity.

Ghosts

Ghostly apparitions and pranks reportedly assailed the Perrons from the outset, sparing only the father, Roger. I read accounts of many of their apparitional experiences with an old familiarity. Such reports represent a common phenomenon well known to psychologists and skeptical investigators. Consider an early experience in the house when Carolyn was abed: she saw her dresser erupting in flames! Trying to react she found herself "paralyzed"—able only to watch the blaze and the sparks it shot off. Subsequently, however, she found not a singe to confirm what she had seemingly seen (I: 156–159).

She had clearly experienced a common *waking dream*, a type of hallucination that occurs in a state between being fully asleep or awake. This was accompanied—as often happens—by *sleep paralysis*, the inability to move because the body is still in the sleep mode (Nickell 2012, 41–43, 109).

Carolyn Perron had another characteristic waking dream in which, stirring from sleep and "sensing a presence" (a common experience), she opened her eyes and saw "The grotesque figure of a woman hovering above her." Again "immobilized," she watched the ghostly form approach as she reacted in terror, then—"It was gone" (I: 185–187). Andrea had a similar "nightmare," saying, "It woke me up but then I couldn't move" (I: 191). One doesn't have to be in bed to have a waking dream. Eight-year-old Cindy was playing with toys on her bedroom floor, and "many hours passed without her recognizing it." Then she saw the figure her mother had told the children about, and that Cindy had later seen "*in a dream*" (original emphasis). Now, in a "soft glow," the figure emerged from the closet, and seeing it "instantly paralyzed Cindy" (I: 222).

Sometimes, however, Carolyn or the girls had an apparitional experience other than a waking dream. Andrea, for instance, during daily activity, saw "a family: a man, a boy and his dog, standing side-by-side, peering through the wall of her bedroom" (I: 473). Cindy, who exhibited many of the traits associated with a fantasy-prone personality, once whispered to her mother, "Mom, there's a whole bunch of people eating in our dining room" (II: 69–70). On another occasion, Cindy saw several "little ghosts"—"native children"—playing in a nearby pine grove (II: 164–165). Apparitions tend to be perceived during

altered states of consciousness. Many occur while the percipient is tired, in a relaxed state, daydreaming, or performing routine work—conditions in which, particularly with imaginative persons, a mental image from the subconscious might be briefly superimposed on the visual scene, rather like a camera's double exposure (Nickell 2012, 110).

Poltergeists

In addition to ghosts, so-called poltergeist phenomena were common at the Perron farmhouse. Although the superstitious attribute such pranks and disturbances to an invisible agency, a supposed spirit called the poltergeist, history indicates that the occurrences typically center around one or more real mischief makers in a household, perhaps acting from hostility or just seeking attention. Many have been caught at their secret misbehavior, while, on the other hand, science has never confirmed the existence of a single poltergeist (Nickell 2012, 325–331).

A good example of an apparent little "poltergeist" at the Perron home occurred for a period when older sister Andrea set up after-school classes with herself as teacher, using an old oak-framed slate blackboard. However, she tells us that "some scoundrel spirits from the Netherworld did not appreciate having to attend school and would play nasty tricks. . . ." The chalkboard was a target, being repeatedly smeared, often even erased, and was eventually completely smashed. Although Andrea believed it was all of the girls' "favorite pastime," I suspect that one of them secretly resented the extra "school" time their big sister was subjecting them to. To such reports, Lorraine Warren gave a knowing smile and said, "poltergeists"—as if her "clairvoyance," rather than her fantasy proneness, told her so. States Andrea (I: 448):

> As one of the most active rooms in the house, the kitchen attracted someone, maybe more than one spirit. The telephone was frequently tampered with, as were several appliances. Antique bottles were routinely arranged and rearranged, moved from open shelves to windowsills then back again; someone had a flair for interior design! A pile of dirt left on the floor, the broom propped beside it, leaning against a chair; a message received then ignored. Household provisions spilled and splashed about the premises, chairs pulled out from beneath children; hair pulling was always a less-than-gentle reminder of their omnipresence. And the flies!

Investigators, however, will need more and precise evidence than the recollections of schoolgirls some thirty to forty years late in order to conclude who the real poltergeists were. But suspects are readily at hand.

We must ask, did the supernaturally inclined Cindy really have her hair "knotted" by a spirit? Was she actually "dragged to the floor"? Was she genuinely "trapped" in a wooden box in the shed (where she had hidden during a game of hide-and-seek)? Or was she deliberately play-acting or even just fooling herself? (Perron II: 53, 48; cf. Nickell 2012, 347). The late psychologist Robert A. Baker, my long time ghost-hunting colleague, found that sometimes events that were attributed to a pranking entity (such as a telephone flying off a table) could have a simpler explanation (the cord was snagged by the leg of a chair and pulled when the chair was scooted forward) (Baker and Nickell 1992, 135–139).

Witches and Demons

Even when the best evidence warrants a mundane explanation, Andrea still invokes the supernatural. For instance, her father was once angry about something and "touched a handle on the pot of meatballs" cooking in the kitchen, whereupon "it flew off the stove and hit the floor," splattering him with sauce. Andrea insists she "saw that pot of meatballs go *flying* off the surface of the stove *without* the assistance of her furious father." She wondered if the "Kitchen Witch"—a historic local figure named Bathsheba Sherman the Perrons obsessed on—was actually responsible (II: 236; I: 298).

Carolyn Perron had researched local history and found that Bathsheba had been charged with the murder of a child, although the case was dismissed. Nevertheless, people purportedly whispered she was a witch who had sacrificed an infant to the Devil (II: 299, 321, 404). But was Bathsheba instead—as Mrs. Warren told them, according to Andrea (I: 328)—"the lone demonic presence in their house?" Did Lorraine Warren really use her psychic powers to divine this? Apparently not: Carolyn Perron had told the Warrens about Bathsheba Sherman. Andrea says her mother let the Warrens have her notebook—filled with "meticulous notes" and sketches of frightening entities—but it was never returned (I: 404–405; II: 298–299, 314).

Mrs. Warren went on to suggest that some specific reported incidents—some knocking sounds, the house shaking—were not due to fierce winds but were instead "demonic in nature" (I: 53, 311, 313). Soon, whereas the Perrons had intended what they were telling the Warrens to be kept in confidence, they found otherwise when curiosity seekers began showing up unexpectedly. Among them were a "cluster of ghost hunters" and a man "with only one tool-of-the-trade in hand: his Holy Bible." The Warrens, it turned out, were giving public lectures about the "case"; they even "named the town and described the farmhouse." Carolyn Perron "felt utterly betrayed" by the Warrens (II: 324–329).

Nevertheless, their relationship culminated in Carolyn's agreeing for the duo to hold what was supposed to be a séance. But it became an "infamous séance"—part ghost-hunting session, with lots of cumbersome equipment (which does not of course detect invisible beings), and part intended exorcism, including, in addition to a medium/shaman/holy woman and a parapsychologist from Duke University, a priest. Carolyn Perron told

her husband nothing of this until the Warrens' entourage showed up again at their door. Roger was livid.

As the "cleansing" ritual progressed, the suggestible Carolyn began to work herself into the state obviously expected of her. As the group prepared, she looked "unresponsive" with "vacant hollow eyes." When the group held hands—except for the protesting Roger—Carolyn began to mumble incoherently. "A low-pitched guttural utterance emerged from deep within her being as her quaking body trembled in place." Suddenly, "Carolyn's chair lifted from the floor and flew straight back, traveling at light speed into the parlor. She hit the floor with such force everyone present could hear the air rushing from her lungs" (II: 346–358).

No doubt Carolyn—perhaps unaware—was simply acting like those folk who "go under the power" at a Pentecostal service, falling, twitching, or what have you, just as expected of them. The process is akin to stage hypnosis, involving suggestion, compliance, and role-playing (Nickell 2013, 206–209). Although Andrea suggests Carolyn's chair was propelled supernaturally and perhaps even levitated, this simply smacks of her usual exaggeration. The chair, I take it, was scooted back by Carolyn and—far from levitating—acted in accordance with the laws of physics, indeed moving "straight back" until it stopped abruptly and tipped over.

Roger Perron did not respond like one who had witnessed a defiance of natural law. Commendably, he first rushed to his wife's aid, and as Ed Warren attempted to pull him back, "He whipped around and punched Ed directly in the face, dropping him to the floor." Seeing Ed's nose bleeding, Lorraine wiped his face. Roger ordered the bunch out of his home, whereupon—when the ghost "techs" went to fetch their equipment from the haunted cellar—they discovered that one or two, ah, poltergeists had managed during the hubbub to smash every one of their ghost/demon-hunting devices. Two of the girls, Andrea and Cynthia, had secretly watched the dining-room séance "through a crack in the door," putting them near the cellar door; Chrissy had, unbelievably, slept through it all; and April was in and out of her room. Apparently no one could or would say anything about the broken devices (II: 358–362).

After slamming the front door behind the group, Roger said what he really thought. As Andrea tells us (II: 362): "He bitterly resented the intrusion, the theatrical farce of a pseudo-intellectual endeavor: ritualistic nonsense. Fake. . . . Roger considered their little sideshow a charade. . . ." After an earlier visit of the demonological duo, Roger had asked his wife: "Don't you realize when you're being played?" Calling them "a pair of two-bit charlatans," he warned, "They'll only use you for notoriety, for their own purposes" (II: 263).

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Conclusions

There were no magical beings—ghosts, poltergeists, witches, or demons—in the Perron home, only an erstwhile Catholic family given to occult beliefs. Influenced by folktales, their waking dreams, contagion (the spreading of belief from person to person by suggestion), and probable pranking by one or more of the five girls, the mother and daughters excitedly hyped their experiences and feelings into a full-blown case of haunting. Provoked by the father's skepticism, the other six dug in their heels and were seemingly motivated to exaggerate and even create evidence.

It remained for a phony demonologist and clairvoyant to seek to capitalize on the family troubles, to emphasize demons over ghosts, and to plant the idea of potential possession. Although the horror film *The Conjuring* (2013) greatly exaggerates the case and suggests a possessed Carolyn Perron was freed of her "demon" after a wild exorcism, in fact it is apparent Mrs. Perron was simply caught up in suggestion and role-playing. Moreover, the Perrons continued to be plagued by nine spirits—or rather their belief in same—for several years to come (Elsworth 2013). ■

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[THINKING ABOUT SCIENCE MASSIMO PIGLIUCCI

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The Epistemology of Thought Experiments, Part 1

My colleague Maarten Boudry and I just put together a collection of essays (*Philosophy of Pseudoscience*, University of Chicago Press) on what philosophers call "the demarcation problem," the issue of what exactly separates sound science from bad science and pseudoscience. It's the kind of somewhat arcane issue of interest to philosophers and the kind of people who read the Skeptical Inquirer, but it is notoriously difficult to get the general public involved, despite the fact that pseudoscientific practices often have (negative) consequences on people's welfare.

Imagine my surprise, then, when I opened a recent issue of the *New York Times* (September 28, 2013) and saw an article by Stephen Asma (a philosopher, it turns out) focused on the demarcation problem! This should have been good news (Hey! The most widely read paper in the world is talking about demarcation, and they asked a philosopher to do it!), except that the headline immediately gave me a bit of trepidation: "The Enigma of Chinese Medicine."

And sure enough, my fears were unfortunately confirmed. The piece begins with a gory episode where Asma, who is married to a Chinese woman, is at a Beijing restaurant and complains of a cold. The proprietor of the restaurant—prompted by Asma's wife—brings a live turtle to the table, slits its throat, and offers the fresh blood to Asma, who takes it (albeit uncomfortably), goes home, and "somehow" begins to feel better in the course of the following days.

Let's set aside for a moment the ethics of brutally killing an animal that can feel plenty of pain just so that your cold becomes less importune. Asma isn't so naive as to actually infer a causal connection between drinking turtle blood and improving cold symptoms. He mentions the placebo effect but he says, "Who knows, maybe one of these days science will discover that turtle blood does contain some chemical that has an effect on the common cold virus." Yes, maybe. But even so, it wouldn't be a validation of Chinese "medicine," understood as a coherent body of practices and theories about human health. It would be just another example of a folk remedy arrived at by random trial and error that turns out to work for perfectly "Western" scientific reasons. As comedian Tim Minchin aptly put it, if "alternative" medicine works, we simply call it medicine.

As comedian Tim Minchin aptly put it, if "alternative" medicine works, we simply call it medicine.

The rest of Asma's article is full of half good points and abysmal non sequiturs (which, for a philosopher, really ought to be a no-no!). For instance, he correctly points out that Karl Popper's idea of falsification as the demarcation criterion between science and pseudoscience is too simple to account for the actual complexities of the scientific process. But then he goes on to claim that being "well versed" in logic doesn't guarantee you won't believe in woo. His example? Arthur Conan Doyle's (Sherlock Holmes's creator) belief in the curse of Tutankhamen. Asma seems to have mistaken the logical powers of Doyle's (fictional) creation for those of the novelist, and at any rate *of course* acquaintance with logic doesn't *guarantee* that one accepts only true beliefs. So what? Should we therefore throw out logic and critical thinking altogether?

But the real kicker arrives near the end of the article, where Asma compares Chinese medicine's concepts of qi energy and body "meridians" with natural selection, genes, and the Higgs boson. Well, you know, they all refer to invisible entities, and they all carry "explanatory power." Seriously? Asma himself seems to balk at the enormity of his own parallel, as he quickly adds that, admittedly, "the metaphysical causal theory [on which Chinese medicine is based] is more controversial." Well, if by "more controversial" you mean entirely made up without a scrap

of evidence and in likely contradiction of known physical laws, yes, I'd say that's more controversial.

After telling his readers about his adventures with turtle blood and feng shui, Asma continues: "While lying on the acupuncturist's table in China recently, I wondered if I was too skeptical or too gullible about qi." I wonder whether the reader will be able to guess which way my own judgment on the matter lies.

The crucial question, of course, is why is an otherwise accomplished writer and philosopher like Asma writing this sort of stuff (not to mention why it gets published in the *New York Times*). I will not speculate on possible psychological motives (as I mentioned above, his wife is Chinese), as I don't know the guy personally. But this sort of thing is unfortunately not unheard of among even very prominent philosophers: in the last few years philosopher of mind Jerry Fodor has coauthored a book about Darwin being wrong, and philosopher of mind (another one!) Thomas Nagel has published a volume in which he questions the current methodological and metaphysical commitments of science itself (without really offering a sensible alternative).

It is good to have people from outside of science, but who are well acquainted with its inner workings, to keep an eye on the epistemic warrant and underlying assumptions of scientific theory and practice. That's what philosophy of science (and also history and sociology of science) at its best is supposed to do. It keeps the conversation going, and hopefully minimizes the scientistic tendencies of some practitioners of science, infusing a bit of humility and prompting more transparency in the whole enterprise. But Asma, Fodor, Nagel, and others aren't doing science—or philosophy, for that matter—any favors by indulging in misguided criticism and the sort of "open mindedness" that Carl Sagan warned against (your brain may fall out). The demarcation problem is a serious one because science has extraordinary social cachet and commands huge sums of public financing, as well as because pseudoscience maims and even kills people. But please let turtles live in peace, and get used to the fact that there just isn't a remedy for the common cold. Nor are there such things as qi energy and meridians. ■

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Sheaffer's "Psychic Vibrations" column has appeared in the SKEPTICAL INQUIRER for more than thirty years; its highlights have now been published as a book (Create Space, 2011). Sheaffer blogs at www.BadUFOs.com, and his website is www.debunker.com.

Between a Beer Joint and a Highway Warning Sign: The 'Classic' Cash-Landrum Case Unravels

I have always felt that the famous Cash-Landrum case of December 29, 1980, was perhaps the most puzzling and vexing UFO case on record. If the events actually occurred as reported, then no prosaic explanation was possible. On the other hand, there was no solid independent evidence to substantiate the witnesses' claims despite years of searching. As the skeptical Fortean Peter Brookesmith wrote, "To ufologists, the case is perhaps the most baffling and frustrating of modern times, for what started with solid evidence for a notoriously elusive phenomenon petered out in a maze of dead ends, denials, and perhaps even official deviousness" (http://goo.gl/iWUpb4).

This is a very complex case and space does not permit it to be fully described here. As summarized on About.com in its "Best UFO Case Files," while the witnesses were driving about at 9:00 PM near Houston, Texas:

> They soon encountered a diamond-shaped UFO hanging over the road ahead. The two adults, Betty and Vickie, first thought that they were seeing a helicopter or airplane. [Colby, Vickie's seven-year-old grandson, was also in the car.] There were several airfields not too far from them. But this object was not like a helicopter, plane, or anything else they had seen before. The large, menacing UFO would from time to time shoot reddish-orange flames toward the asphalt road below.

> Betty, though frightened, was somewhat fascinated by the other-worldly looking object. She was now out of her car, and watching the UFO as it hovered above and ahead of them. Suddenly, the skies were full of helicopters. Betty remarked: "They seemed to rush in from all directions ... it seemed like they were trying to encircle the thing."

Flames from the object were supposedly strong enough to make the car body too hot to touch. Reportedly, severe health effects began almost immediately, especially for Betty Cash. According to a Wikipedia entry:

> That night, they all experienced similar symptoms, though Cash to a greater degree. All suffered from nausea, vomiting, diarrhea, generalized weakness, a burning sensation in their eyes, and feeling as though they'd suffered sunburns.
>
> Over the next few days, Cash's symptoms worsened, with many large, painful blisters forming on her skin. When taken to a hospital emergency room on January 3, 1981, [Jerome] Clark writes, Cash "could not walk, and had lost large patches of skin and clumps of hair. She was released after 12 days, though her condition was not much better, and she later returned to the hospital for another 15 days." (http://goo.gl/iWUpb4)

This has given rise to the common belief that the witnesses were exposed to some sort of "radiation" and suffered its ill effects. However, on closer examination this does not hold up. Brad Sparks, certainly no UFO debunker, wrote in 1999 that "it does NOT ap-

pear that the Cash-Landrum symptoms were due to ionizing radiation or 'radiation sickness' for the reasons listed below. I reviewed this case for APRO [Aerial Phenomena Research Organization] in the early 80's but was not able to publish the results of my analysis for various reasons. Radiation oncologist and APRO consultant Dr. Richard Niemtzow reviewed my findings and agreed that the symptoms did not match those expected for ionizing radiation syndrome" (http://goo.gl/j5fXU1). Skeptic Gary Posner, MD, looked at the reported symptoms and came to the same conclusion. If radiation were involved, according to Posner, the reported symptoms would have indicated a fatal dose. Since both women lived many years after the incident—and Colby is still living—nobody received a fatal dose of radiation, and the reported symptoms, if correct, must be caused by something other than radiation (also see his letter on page 16 of the April 1983 MUFON Journal, http://goo.gl/CpwGph). However, there is no independent confirmation of these symptoms.

This case has received extensive media attention, on *That's Incredible* (ABC-TV), *UFO Cover-up Live*, *Unsolved Mysteries*, *Sightings*, and *UFO Hunters*, to name just a few. The principal investigator of the case has always been John F. Schuessler, a well-known MUFON director, also affiliated with several other UFO organizations. He wrote a book *The Cash-Landrum UFO Incident*.

Curt Collins is a UFO researcher who for the past year or so has been gathering as much information as possible on the Cash-Landrum case. He has shared this information on his blog at blueblurrylines.blogspot.com. Collins was a "contributing editor" helping the late, great James Moseley put out his semi-legendary newsletter *Saucer Smear*.

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Vickie Landrum (left) and Betty Cash

Collins titled his blog dated November 12, 2013, "The Cash-Landrum Incident: The Suppressed Case Files." Collins wrote:

> The physical evidence in the Cash-Landrum UFO incident is much of what makes it such a compelling and enduring case. Another key factor is the reputation and expertise of the case's chief investigator John F. Schuessler who had the difficult jobs of seeking evidence, promoting the case and protecting the witnesses. The medical records have been long protected by Schuessler, citing the privacy of the witnesses as reason for withholding them. What is less widely known, is that there was other case evidence that Schuessler chose not to share. (http://goo.gl/ekhBeJ)

After the women went to the Bergstrom Air Force Base in Austin to file a complaint, the Texas Department of Health's (TDH) Bureau of Radiation Control did an investigation into the matter. Collins writes:

> The TDH report revealed that there was no residual radiation found along the road, but they were not dismissing the case. They made an important offer: they were interested in continuing the investigation, starting with their doctors examining the medical records. There is no documentation of it in the TDH files, but Schuessler refused or ignored the State's offer to help the witnesses.

Claimed physical traces from the incident seem to be among the strongest pieces of evidence supporting the case. Collins writes, "When discussing the case, Schuessler told how the witnesses were able to return to the precise location, and that the scene contained some identifiable, distinct features":

- "It is interesting to note, that although neither Vickie or Betty had been back to the site since the incident, they both were able to take us to nearly the exact same location. The separate site visits verify the location of the incident for us."—*The Cash-Landrum UFO Incident*, page 54.
- "They were able to point out a spot on the road that indicated that it had been heated to an extreme level of heating. It was burned, and it was very clear to the naked eye."—*Unsolved Mysteries* (NBC), February 6, 1991.
- "We had a very large flying machine that came over the road that actually left marks on the road, so you know where it was exactly."—*Sightings* (Sci-Fi Channel TV Series): "Physical Effects," July 31, 1992.

There are, alas, no photographs or other evidence to show us these supposed UFO marks on the road. One wonders why.

In the newly revealed document, Collins notes that Texas Department of Health investigator Charles Russ Meyer wrote:

> I then asked Mr. Schuessler if he had pin-pointed the location of the siting [*sic*]. Mr. Schuessler stated that due to the late hour and the ladies' emotional state they could only state that they believed they saw the object on the straight portion of FR 1485 between a beer joint and some kind of highway warning sign.

In other words, neither Cash, nor Landrum, nor Schuessler had any idea where this incident actually took place! This is confirmed in a second previously unseen document that Collins found: Alan Hendry's 1981 report on the case for the Fund for UFO Research. Hendry wrote, "Flames intermittently 'whooshed' down towards the road; later examination showed no marks on the pavement." Collins remarks:

> The Meyer report documenting that Schuessler and the witnesses not knowing the precise sighting location does answer some troubling questions. Now we can understand why there are no photographs of a scorched road or trees, and why soil/pavement samples were never presented as evidence. The claim that the sighting location was found and investigated was the foundation of his case. If this claim was false or inaccurate, the entire case is tainted. It raises other questions about how evidence was presented and just how much of it can be verified.

In other words, it appears that Schuessler simply made up the claim to have identified, and investigated, the sighting location, and found evidence there.

There is also the puzzling question of why the proponents of this case remain so utterly opposed to releasing any of Betty's medical records, even after her death, and especially after so much anecdotal data about her alleged medical conditions has already been discussed publicly. Why? You cannot simultaneously cite alleged medical symptoms as proof of a UFO encounter while refusing to release the medical records that might confirm or refute the claim. As long as the medical records remain private, anecdotal accounts of what they contain are worthless.

These claims of harmful effects led Cash and Landrum to file for $20 million in damages against the U.S. government in 1981. They were represented pro bono by UFO lawyer Peter Gersten, who attracted much attention in 2012 by his announced plan to leap from Bell Rock in Sedona, Arizona, at the moment of the winter solstice Mayan apocalypse (but fortunately he had second thoughts and is still alive). A U.S. District Court judge dismissed the suit in 1986 on the grounds that U.S. government involvement had not been demonstrated. It ought to be quite straightforward to trace a fleet of twenty-three Chinook helicopters flying over the United States. Much effort has been expended to trace such helicopters to no avail.

While we were discussing this case via email, Gary Posner, MD, wrote:

> I recall a photo being shown [on the April 1, 1982, edition of ABC-TV's *That's Incredible*] of Betty's arms, with discrete, round, sunburn-type rashes that immediately caused me to suspect that she had created them by covering her arms with a garment containing circular cutouts and then exposing herself to sunlight (or a sunlamp).

There is no way that such discrete, round patterns could be produced by radiation from a distant object. What Posner is suggesting is that, like religious zealots of yore who fabricated their own symptoms of "stigmata," Betty Cash created the discrete, round "radiation burn" patterns on her arms to be able to display impressive symptoms to her doctors.

Medical science has a term for this kind of behavior, Münchausen syndrome, which is a psychiatric factitious disorder wherein those affected feign disease, illness, or psychological trauma to draw attention, sympathy, or reassurance to themselves. While not terribly common, it is far from rare. And assuming that Betty Cash's medical records contains the term "Münchausen syndrome" or words to that effect, which seems likely, we now understand why the promoters of the Cash-Landrum case adamantly refuse to let anyone see her medical records. It would destroy all vestiges of credibility that this case ever had. ■

[NOTES ON A STRANGE WORLD

MASSIMO POLIDORO

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The Lure of Mysterious Paintings

What often looks to us like a mystery from the past can have very simple explanations once you understand the contemporary frame of mind.

Part One

Looking at a painting in a museum, an exhibition, or even printed in a book is an experience available to anyone. It can stimulate wonder, awe, and passion—but also indifference, anger, or repulsion. The feelings and the sensations a painting can transmit today can be the same as when that particular canvas was painted centuries ago. However, contemporary references, shades, fashions, and habits change significantly over time and make some paintings ambiguous or even incomprehensible. Reinterpreted in a modern framework or to a contemporary eye, they can sometimes take on new and surprising meanings that were not intended by the artist.

A classic example is the *Last Supper* by Leonardo da Vinci, reinterpreted in a heretical key in *The Da Vinci Code* and which we have already discussed (see "Notes on a Strange World" column, SI, September/October 2013). Despite Brown's book being a novel whose speculative plot points were lifted from fantasies elaborated by earlier writers, controversy erupted involving art historians, scholars, and theologians of Christianity. The truth is that the painting of Leonardo fully complied with the stylistic canons of the time and did not contain anything heretical.

However, a lack of knowledge of the historical and iconographic references related to the era in which the painting was made can easily mislead a modern observer. This is a problem often encountered in examining relics or artifacts from the past.

Here are a few examples of how the true meaning of a painting can easily be misunderstood or reinterpreted (especially by the conspiracy-minded).

The Two St. Matthews

If today we cannot grasp certain subtleties in art, they certainly did not escape contemporary observers. Works that to us may seem perfectly harmless could instead cause scandal and even jeopardize the reputation, if not the life itself, of the artist.

Caravaggio, for example, was repeatedly forced to redo paintings commissioned from him because they did not meet the required characteristics. One example is that of a St. Matthew, commissioned in 1602 for the Church of St. Louis of France in Rome. The demands were clear: the saint had to be represented as he wrote the Gospel, and to show that the Gospels were the word of God, an angel of inspiration had to be placed close by. Caravaggio, even then an original and uncompromising artist, had imagined an old and poor worker, a simple man, suddenly grappling with a book to write. So he painted St. Mat-

Caravaggio's original St. Matthew painting, which shows St. Matthew as a clumsy, simple man.

Caravaggio's redone St. Matthew painting after criticism from the church of St. Louis of France in Rome.

thew bald, with bare and dirty feet, clumsily grabbing the bulky volume and furrowing his brow with anxiety in the unusual effort, for him, of writing. At his side he painted an angel who gently guides his hand as a teacher can do with a child.

When the congregation of the church saw the painting they were shocked by the seeming lack of respect with which the saint was portrayed. Caravaggio was forced to redo the painting strictly in accordance with more conventional ideas about the appearance of a saint and an angel. Today, of the two paintings only the second survives, still preserved in the original church; the first one, bought by Vincenzo Giustiniani and then passed to the Museums of Berlin, was destroyed during the bombing of World War II and now only survives in black and white pictures.

Change the Title, Change the Picture

All in all, Caravaggio was still lucky. As was Paolo Veronese, to whom the Dominicans of the Basilica of SS. John and Paul in Venice commissioned a Last Supper for their refectory. As soon as he received the assignment, Veronese reinterpreted the theme from an innovative point of view, depicting the table of Christ and the apostles in a large building full of people, pages, jesters, and children playing on the stairs. Such was the rejection of that interpretation that the prior turned to the Holy Inquisition. Veronese found himself on trial in 1573, forced to defend himself before the tribunal of the Holy Office. "Does it seems fitting to you that the Last Supper of our Lord is crowded with buffoons, drunkards, Germans, dwarfs, and similar profanity?" the inquisitor asked indignantly. The painter tried to defend his work, but was eventually forced to surrender. It was known that the Inquisition was not too fussy when it came to prosecuting heretics. However, instead of changing the painting—an arduous undertaking since it was already completed—it was agreed that it would have its title changed, thus turning it into the dinner at Levi's house, another episode of the Gospel according to Luke in which Matthew, or Levi precisely, prepares a great feast in his own abode.

The Night Watch

The Night Watch by Rembrandt from 1642 is one of the most famous paintings in the world, inspiring plays, movies, songs, and even the movement of a symphony by Gustav Mahler. Yet its famous title does not describe at all the subject of the painting. Originally executed for the Civic Militia of Amsterdam, it portrays in the center Captain Cocq and Lieutenant van Ruytemburgh, surrounded by musketeers. One girl is wearing a chicken hanging from the side that calls itself the symbol of the Militia. But the painting is not at all a patrol, but the beginning of a parade, when the members of the company are proudly preparing to parade along the streets of the city. It does not even take place at night. The dark tones of the picture are due to yellowing of protective coatings, that gradually oxidated over the centuries. Its more appropriate name would be *The Company of Captain Frans Banning Cocq*, but there is no doubt that this painting, the flagship of the Riijksmuseum in Amsterdam, will forever be known by its "wrong" title.

Hall of Mirrors

The subject of a painting can be very different from the one it appears to be. Looking at *Las Meninas* by Diego Velázquez from 1656, our focus is on the Infanta Margarita, at the center of the picture, surrounded by the bridesmaids (*las meninas*, of course). But a closer look reveals that in fact the true subject of the work is…out of the picture. Velázquez himself can be seen on the left while he is busy painting something on a large canvas, and he and the Infanta, the bridesmaids, the dwarf, and the adults in the background all look toward us. Look at what? The two sovereigns of Spain, King Philip IV and his wife, Marianne, who are clearly the subject of the painting Velázquez is painting. What gives this secret away is the mirror placed on the back of the room in which one can see the reflection of the two rulers. A similar game, but from the opposite point of view, had been made two hundred years before by Jan van Eyck in his painting *The Arnolfini*, now at the British Museum in London. In that case there was a mirror in the back of the room, but reflected inside it was the painter himself. ■

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The Mystery of the Texas Chupacabra

Q: I found this old picture of a hairless animal from the 1950s. . . . It's being called a chupacabra. I think it's an opossum, but others think a fox. What are your thoughts on this weird mystery?

—Andrew D. Gable

A: "What is it?" indeed! What is that strange creature, and what if anything does it have to do with the chupacabra, one of my favorite monsters and the subject of my book *Tracking the Chupacabra: The Vampire Beast in Fact, Fiction, and Folklore*? In order to answer this question, I located and bought the original photograph on eBay (Figure 1). Once I had it in hand, new questions were raised and I soon launched an investigation into this curiosity.

Several aspects of this mystery soon surfaced. The first question that arose was if the animal in the photograph was actually referred to as a "chupacabra." This is important because in my research I concluded that the chupacabra, as a mysterious vampiric creature, only came into existence in 1995. After my book came out I was contacted by over a dozen people who insisted that they had heard about the chupacabra long before 1995, in some cases dating back to the 1970s and 1950s (Radford 2011a). A reference from the 1950s to a strange creature would be documentary proof that some of my conclusions about the creature's origins were wrong. I was eager to put my detective work to the test. The second question was the origin of the photograph, including where it had come from and where it had originally been published, because no one seemed to know. Third, of course, was identifying that strange animal if possible.

Figure 1. A "Dog-like Creature Called the Chupacabra" press photo from 1950.

Figure 2. Detail image of the "chupacabra" photo reveals trace evidence of photographic manipulation.

I began by taking a much closer look at the photograph itself; whether the subject is a famous lake monster photo or a ghostly image, an examination of the original photograph (or as close as you can come to it) is always best. Information vital to solving a mystery can easily be lost when an image is cropped, copied and reproduced, and so on. My best chance for solving this mystery lay in clues embedded in the photograph itself. Upon close inspection with a high-powered magnifying glass, I soon came to the shocking discovery that the

photo had almost certainly been altered (see Figure 2).

A fake! A hoax! A ringer! A photographic snowjob arranged by some cryptozoological mystery-mongering yellow journalist!

Well, not necessarily. Though not obvious at first glance, the photo had been retouched—not necessarily for deception but for publication. This was common practice for photographs in the 1950s and later. As Mia Fineman, author of *Faking It: Manipulated Photography Before Photoshop* notes, "Many of the earliest instances of photographic manipulation were, in fact, efforts to compensate for the new medium's technical limitations—specifically, its inability to depict the world the way it looks to the naked eye" (Fineman 2012, 9). Thus, for example, photographers would sometimes manually compensate for an underexposed image by adding some strategically placed lines or shading. The intent was not deception but instead its opposite, accuracy; the retouching would help to clarify what the different elements of the photograph were.

In this case there are several examples of retouching: the man's shirt collar has been outlined to make it stand out; the outline of his thumb just under the animal's left ear has been drawn in; the creature's eyes have been enhanced; and most obviously, the teeth in the lower jaw of the creature have been made much more prominent. The altering consists mostly of filling in some details, making edges sharper, and adding contrast. There's no reason to think that the image itself is faked, or that the retouching was done to obscure the animal's true nature.

In fact from an investigation standpoint the photograph itself is far less interesting and important than what is on the back (see Figure 3). The various editorial notes written and taped to the back of the photograph offer a revealing glimpse into the evolving folklore of the chupacabra. With a little detective work informed by a journalism background, we can decipher the trail and piece together a history of this photograph and discover how a 1950s "What is it?" became a 2012 "chupacabra."[1]

The first mark on the back of the photo was a standard journalism permissions stamp from Acme Newspictures, now owned by Corbis. Later on, a news clipping was taped on top of that stamp showing that the photo was published March 10, 1950, with the caption "What Is It? If you know, you might tell Charles Hudson of Dallas, Tex. His coon dogs ran the strange creature down and killed it before he could stop them. It has the head of a fox, tail of a possum, feet like a raccoon and is completely hairless."

It's not clear where this description came from—whether Hudson himself told the photographer that his creature had fox, possum, and raccoon features, or whether an unnamed zoologist or veterinarian had weighed in on the strange find. In any event it was a weird news story likely to generate interest and move papers, and that was the only issue that mattered to the editors.

But which editors, where? According to the seller's eBay listing, the photo came from the archives of the *Chicago Sun-Times*, *Chicago Daily News*, *Detroit News*, and *Sport* magazine. I had no way of knowing which of those papers it appeared in, and because the newspaper clipping was pasted to the back of the photograph, removing it would have damaged one or both documents. However, using a specialized high-powered forensic light I examined the newsprint on the other side of the pasted clipping and discovered that the photograph had in fact appeared in the

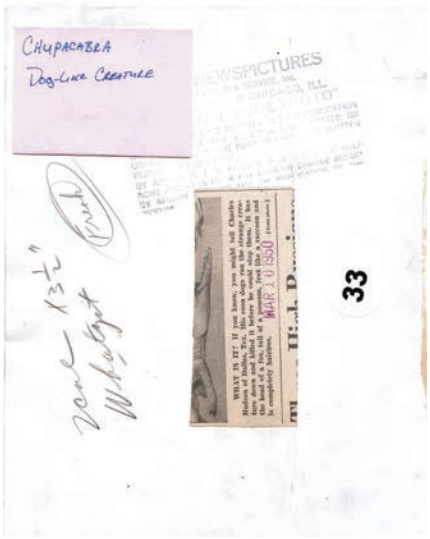

Figure 3. The back of the "chupacabra" photograph is rich with editorial information about the image's history.

Figure 4. Through restricted backlighting the identity of the newspaper that published the mysterious "chupacabra" photo in 1950 is revealed: *The Chicago Daily News*. According to the advertising slug, not only is the *Daily News* easy to read, but it is also worth reading.

Chicago Daily News (see Figure 4).

Thus with some degree of accuracy we can trace the evolution of what this strange creature was thought or assumed to be over time: a "What is it" and a fox/possum/raccoon chimera in 1950; later on (likely in the 1960s or 1970s) a freak or "Whatzit"; and finally in the 1990s or 2000s a "chupacabra" or "dog-like creature."

This mirrors the process I uncovered in researching my chupacabra book; as I and others have noted, understanding a monster's cultural history is crucial to understanding its nature. Daniel Loxton and Donald Prothero state in their acclaimed recent book *Abominable Science!* about Bigfoot, "What we want to discover is: Where the heck did the Bigfoot idea come from in the first place? Has the legend changed over time? Does the story feel compelling only because we are steeped in decades of … folklore and popular culture?" (Loxton and Prothero 2013, 31).

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I discussed this folkloric and lexical history in a recent Discovery News article:

> How can badgers, coyotes, foxes, raccoons, dogs, and other animals all be (at least temporarily) called the chupacabra? How is it that chupacabras can be everywhere and yet their existence remains unproven? The answer lies in the lexical evolution of both the word "chupacabra" and the public's understanding of what it means. In the mid-to-late 1990s, chupacabra referred to a very specific, unique creature: a bipedal animal that stood about 3 to 5 feet tall; had long arms and legs; a large oval-shaped head; alien, wraparound eyes; and a distinctive row of spikes down the spine. This was the original description given by the world's first chupacabra eyewitness in August 1995 in Puerto Rico. The creature was said to suck the blood out of livestock and small animals. Later research, published in my book *Tracking the Chupacabra* revealed that this original chupacabra report described a monster in a science fiction film, not anything in real life. Thus the whole origin of the monster is based on an eyewitness's mistake.
>
> That original version and definition of the chupacabra largely faded away by about 2000, and a completely new and different version of the chupacabra emerged in the mid-2000s. The two-legged, spiky-backed, blood-sucking alien-type chupacabra all but ceased to exist, replaced by the hairless doglike animals we see today. A string of dead animals were found, most of them in rural Texas. The finders, not knowing what else to call them, used the name chupacabra though the animals had no connection to the Puerto Rican monster at all. This new chupacabra even lost its famous appetite for blood: None of the chupacabras found have any proven connection to blood-drained animals. (Radford 2011b)

Thus by the late 1990s the word *chupacabra* evolved into a catchall name for any weird animal. So what was the unfortunate animal that Mr. Hudson's coon dogs ran down and killed in Dallas, Texas, in early 1950? Unless the carcass was saved and is rediscovered floating in a specimen jar nearly sixty years later, a definitive answer provided by DNA analysis is unlikely to be forthcoming. However, there are more than enough clues about the creature's identity in the photograph to make a pretty solid guess.

Darren Naish, a science writer and paleozoologist based at the University of Southampton, examined the photograph and has concluded that the "What is it?" is probably a raccoon afflicted with mange, a skin disease that causes the hair to fall out. He explained,

> several features of this animal (including the forward-facing eyes, large lower canine teeth, naked rhinarium, obvious claws, and so on) show that it's a carnivore (and obviously an unfortunate freak individual suffering from hair loss). The dark mask around the eyes immediately indicates raccoon, an identification also consistent with the "mid-length" snout, ear shape, limb proportions, tail that's neither short nor all that long, and general shape and size. So, my working hypothesis is that it's a raccoon, and a juvenile one since it doesn't look that big compared to the human in the shot. Note also that its forelimbs are mostly dark, another raccoon feature. By looking at pictures of juvenile raccoons online, I'm happy enough to think that this is the correct identification. (Naish 2013)

So the Texas Chupacabra Whatzit is probably an ordinary raccoon. But an examination of its various incarnations through time reveals much about chupacabra folklore. ■

Note

1. The "What is it?" label was a common sideshow/freak show label or term for some mysterious (often bipedal, manlike) creatures over the decades. The designation "Whatzit," written in pencil on the left-hand side of the photo, is also a newsroom designation for a "sexy" story about something weird or unknown. Note also that the broader news keyword "freak" is written and circled just to the right of the "Whatzit" memo. For more on a "What is it?" in a sideshow context, see Nickell 2005, p. 158.

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Stanislaw Burzynski: Four Decades of an Unproven Cancer Cure

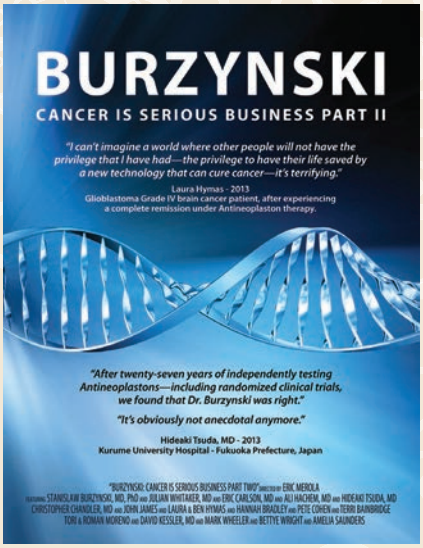
The Houston doctor Stanislaw Burzynski has been using an unproven cancer cure, "antineoplastons," for decades, but despite its lack of proven anticancer activity, he has still not been shut down. Here is a primer for skeptics on his career and claims.

DAVID H. GORSKI

About a year ago, I received an unexpected email from a film producer named Eric Merola asking me if I would appear in his upcoming movie about Stanislaw Burzynski, MD, PhD. Burzynski is controversial, to put it mildly. Since the founding of the Burzynski Clinic in 1977, he has claimed near-miraculous results treating patients with advanced malignancies, particularly deadly brain cancers like glioblastomas. Merola, who had previously released a film in 2010 praising Burzynski as a scientist with a cure for many cancers who is persecuted by the authorities, explained that he wanted a critic of Burzynski in his new movie. Given Merola's history of deceptive filmmaking, I politely declined.

When his second movie, *Burzynski: Cancer Is A Serious Business, Part 2* was released in June 2013, my decision was validated, because the movie turned out to be every bit the propaganda piece for Burzynski that I had feared, a true sequel (Gorski 2013a). Merola's movie also continued a pattern that had begun in 2011 of allies of the Burzynski Clinic attacking critics, in this case portraying skeptics as heartless Big Pharma shills harassing patients with terminal cancer.

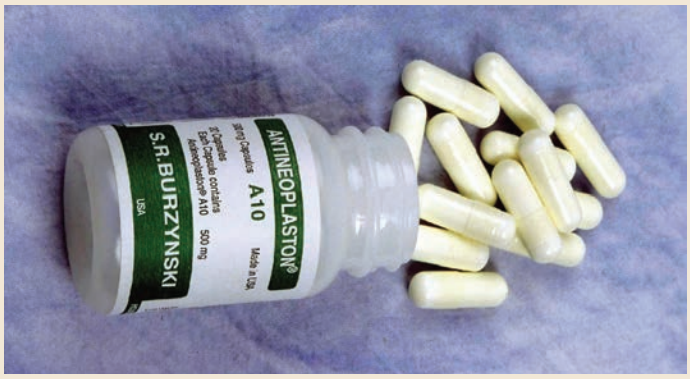
Unfortunately, as propaganda, Merola's movie was sufficiently compelling that the leader of a large skeptical group in southern California who attended a screening in March stood up at the Q&A afterward to say that he was persuaded that Burzynski was on to something (Gorski 2013b). Although he quickly reversed himself and admitted that he had made an enormous mistake (Gleason 2013), the damage had been done, and this skeptic's endorsement can still be found on YouTube (Merola 2013). Given the harm Burzynski has done for four decades and how little most skeptics know about him, Bob Blaskiewicz, who wrote a companion piece to this article about his skeptical activism regarding the Burzynski Clinic, and I decided that a primer for skeptics about Stanislaw Burzynski was long overdue.


BURZYNSKI
CANCER IS SERIOUS BUSINESS PART II
"I can't imagine a world where other people will not have the privilege that I have had—the privilege to have their life saved by a new technology that can cure cancer—it's terrifying."
Laura Hymas - 2013
Glioblastoma Grade IV brain cancer patient, after experiencing a complete remission under Antineoplaston therapy.
"After twenty-seven years of independently testing Antineoplastons—including randomized clinical trials, we found that Dr. Burzynski was right."
"It's obviously not anecdotal anymore."
Hideaki Tsuda, MD - 2013
Kurume University Hospital - Fukuoka Prefecture, Japan

Stanislaw Burzynski: The Early Years

Although little is known about Stanislaw Burzynski's childhood and youth aside from what he himself has told sympathetic sources like his longtime lawyer Richard A. Jaffe (Jaffe 2008) and columnist Thomas Elias (2009), in many ways he represents a classic immigrant rags-to-riches story. Born in Nazi-occupied Poland in the city of Lublin on January 23, 1943, as the Holocaust in Poland was entering its deadliest phase, Stanislaw Burzynski was mostly sheltered from the grim reality of Nazi-occupied Poland during his earliest years because of his mother's wealth. After the war, when Burzynski was five, Stanislaw's older brother Zygmunt was killed fighting the newly installed Communist regime. In his book, Elias quoted him invoking his brother thusly, "The idea of fighting people in authority became natural to me. I learned that you must never let them defeat you in your own core." This sort of determination could have been an admirable trait—if only Burzynski had found a worthy cause to serve.

Unfortunately, the cause he found was antineoplastons.



Jerzy Dabrowski/ZUMAPRESS.com

Antineoplastons

The first use of the word *antineoplastons* (ANPs, derived from "neoplasm," or cancer) in a PubMed-indexed article occurred in 1976 (Burzynski 1976), but Burzynski claims that he had thought of the concept a decade earlier as a medical student at the Medical Academy at Lublin. There, the young Burzynski had become intensely fascinated by amino acids and peptides in wild mushrooms and studied uses for them in agriculture. His work was productive—impressive, even—for a medical student, with six scientific papers indexed in PubMed. In medical school, Burzynski studied differences in peptides and amino acids found in the blood and urine of renal failure patients, claiming that cancer patients had a lower level of some of these substances. In 1968, his work in this area resulted in a thesis titled "Investigations on Amino Acids and Peptides in Blood Serum of Healthy People and Patients with Chronic Renal Insufficiency" (Elias 2009; Green 2001; Smith 1992). By 1970, as a promising young research physician Burzynski was being recruited to join the Communist Party but obstinately refused and soon learned that as a result he would be drafted into the Polish Army. Not wanting to end his research, he fled Poland and arrived at JFK Airport, as he delights in recounting, "with only $20" in his pocket.

After staying briefly with an uncle, Burzynski soon obtained a research position in the Department of Anesthesia at the Baylor College of Medicine in a laboratory headed by Georges Ungar, a Hungarian refugee with whom he immediately hit it off. Ungar was famous at the time for proposing that memory resided in peptides in the brain and for his experiments to "transfer" memory by transferring the putative "memory" peptides from one mouse brain to another. It was a hypothesis that seemed to be supported by his experiments but soon faded from favor (Setlow 1997). At Baylor, Burzynski split his time between working on Ungar's projects and studying his antineoplastons (Elias 2009; Smith 1992). He appeared to be well on his way to becoming a successful cancer researcher, securing an NIH grant in 1974 (Smith 1992, Burzynski 2012) and publishing several peer-reviewed papers.

So where did everything go wrong? How did this promising young Polish researcher evolve into the dangerous "brave maverick doctor" we know today? To answer that question requires a discussion of antineoplastons.

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Do ANPs Work?

After nearly forty years, it is still not entirely clear exactly what Burzynski originally isolated, but it is clear that antineoplastons almost certainly do not have significant anticancer activity. Excellent detailed summaries of the state of the evidence have been provided by Saul Green (2001; 1992) and, more recently, on the American Cancer Society (2012) and National Cancer Institute (2013a; 2013b) websites. In brief, based on his hypothesis that a naturally occurring biochemical system in the body, distinct from the immune system, could "correct" cancer cells by means of "special chemicals that reprogram misdirected cells," Burzynski used gel filtration to separate blood and urine fractions and test them in cell culture for anticancer activity. Of his original thirty-nine fractions, today Burzynski treats patients mainly with AS-2.1 (also known as Astugenal or Fengenal) and A-10 (also known as Atengenal or Cengenal). As Saul Green (2001; 1992) and others (Antineoplaston Anomaly 1998) have

reported, AS-2.1 is the sodium salt of phenylacetic acid (PA), a potentially toxic chemical produced by normal metabolism and detoxified in the liver to phenylacetylglutamine (PAG). To boil ANP chemistry down to its essence, AS-2.1 is primarily a mixture of PA and PAG, and AS-10 is primarily PA. Of note, PA had been studied as a potential anticancer agent years before Burzynski discovered it (Sandler and Close 1959) and, although it has been studied intermittently for fifty years, it has shown little promise against brain tumors (Chang et al. 1999).

Consistent with what is known, the National Cancer Institute (NCI) characterized the concentrations of ANPs required to show antitumor effects in cell culture or animal studies as "excessively high" and reflecting a "lack of activity."

Consistent with what is known, the National Cancer Institute (NCI) characterized the concentrations of ANPs required to show antitumor effects in cell culture or animal studies as "excessively high" and reflecting a "lack of activity" (NCI 2013a), concluding very generously that the evidence that ANPs have significant anticancer activity is "inconclusive." In 1999 the Mayo Clinic published a phase 2 clinical trial of ANPs versus recurrent glioma (Buckner et al. 1999). Other investigators have had difficulty replicating Burzynski's results, including the NCI, Sigma-Tau Pharmaceuticals, and the Japanese National Cancer Institute (Green 2001; 1992). The one exception is Hideaki Tsuda, a Japanese anesthesiologist at Kurume University, who claims to have observed remarkable results in a randomized clinical trial adding ANPs to chemotherapy infused directly into the hepatic artery to treat liver metastases from colorectal cancer. Indeed, Dr. Tsuda appeared in the most recent Burzynski documentary touting impressive results from this clinical trial. Unfortunately, at this writing, these results remain unpublished, and Tsuda's previously published ANP work is not impressive. Amusingly, Eric Merola sent out a complaint on social media lamenting that the *Lancet Oncology* rejected Dr. Tsuda's manuscript, ascribing the rejection to a Big Pharma conspiracy to suppress ANPs (Gorski 2013c).

Over the last decade, Burzynski appears to have given up trying to appear scientific and has not published in anything resembling a reputable journal for a long time. A PubMed search reveals no primary scientific reports since 2006, and the only clinical trials he has published were preliminary results of two phase 2 trials ten years ago (Burzynski et al. 2003; 2004) or retrospective. In short, Burzynski's science has failed to progress since the late 1970s. If Burzynski's science is stagnant now, how did it reach this stage? The answer to this question began nearly thirty-eight years ago.

1976: The Descent from Science Begins

In 1976, Burzynski deemed antineoplastons ready to be tested against cancer in a clinical trial. Characteristically, despite having had no formal training in oncology and no experience in clinical trial design, Burzynski judged himself to be uniquely qualified to be principal investigator of such a trial. Unfortunately for him, internal politics at Baylor had led to Ungar's ouster from the Department of Anesthesia, and the new chair, not unreasonably, did not view Burzynski's research as appropriate for a department of anesthesia. If Burzynski is to be believed, the director of Baylor's new cancer research center wanted to hire him, as did Ungar at his new job. However, Baylor wanted Burzynski to sign away rights to his discoveries (a standard condition in academia), and Burzynski did not want to follow Ungar to Knoxville because he was afraid that the University of Tennessee would impose the same condition. There was another condition that rankled him as well. Shortly after he had obtained his Texas medical license in 1973, Burzynski started working part time at a private practice. There, he had apparently administered antineoplastons to cancer patients, the result being a twenty-one patient case series published in 1977 (Burzynski et al. 1977), implying that he had likely been treating patients with ANPs as early as 1975. Baylor's additional requirement was that Burzynski give up his private practice—a deal breaker, because, as Elias describes, "As long as he [Burzynski] had a private practice, he believed he could use whatever medications he thought most effective, subject only to the consent of his patients." This speaks volumes about Burzynski's attitude toward scientific medicine and ethics, an attitude that appears not to have changed appreciably since then.

In late 1976, Burzynski applied to the Baylor Institutional Review Board (IRB), the ethics committee that approves and reviews human subjects research, to begin a clinical trial of ANPs. He was turned down. Both Elias and Jaffe claim that the reason was because Burzynski didn't have an "investigational new drug" application (IND), which the FDA requires before it will approve a clinical trial of an experimental drug, an explanation that rings false because in general it is not necessary to have IRB approval before applying for an IND (US FDA 2013a). In fact, it is not surprising that the Baylor IRB balked. In 1977 there almost certainly

were not sufficient preclinical data to justify a clinical trial. It wasn't even clear yet exactly what ANPs were, as Burzynski hadn't yet identified all their constituents, and institutional review boards are very reluctant to approve a clinical trial involving compounds that are incompletely characterized. Undeterred, Burzynski shopped his protocol around to other hospitals. Ultimately, the IRB at Twelve Oaks Hospital approved his application. Jaffe's account of this time period (Jaffe 2008) illustrates the incipient ethical slide into oblivion. For example, before leaving Baylor, Burzynski had lawyers investigate the legality of treating patients with ANPs. Their advice to him was that, because Texas didn't have a "mini-FDA" act, in which only FDA-approved drugs could be administered to patients, treating patients with ANPs was legal under Texas law at the time, as long as the ANPs were not shipped across state lines (Merola 2010).

In the late 1970s, Burzynski went to great lengths to obtain the raw materials necessary for his work, given that before he figured out how to synthesize antineoplastons chemically in 1980, isolating ANPs required thirty liters of urine per day per patient. The difficulty in obtaining such huge quantities of "raw materials" can only be imagined, but ANPs could also be isolated from blood. Amusingly, before he left Baylor, Burzynski was notorious for appearing at social functions with blood collection supplies and begging, wheedling, and cajoling friends and acquaintances to donate blood from which he could isolate ANPs. Jaffe drolly noted that after a while Burzynski "noticed he was getting fewer and fewer invitations to parties, and, when his friends would see him on campus or the street, they would turn and walk away quickly, pretending they didn't see him." After Burzynski opened his clinic in 1977, huge quantities of urine were required as raw material to isolate ANPs. To get it, Burzynski arranged to install urine collectors in public parks and even the state penitentiary system. He even collected urine from Gilley's Bar, where *Urban Cowboy* was filmed. Perhaps John Travolta himself contributed to some of those early ANP batches.

Abuse of the Clinical Trial Process

One of the most common claims made by Burzynski and his supporters is that he must be on to something because the FDA keeps letting him register phase 2 clinical trials and even let him register a phase 3 clinical trial in 2010. Phase 2 trials are small preliminary clinical trials, sometimes not randomized, designed to identify indications of efficacy. They lay the groundwork for phase 3 trials, which are the large randomized clinical trials that ultimately result in drug approval by the FDA. To date, although Burzynski has published occasional case studies and partial results of two phase 2 trials, he has not published the complete results of any of his phase 2 trials. Of the sixty-one clinical trials registered on ClinicalTrials.gov with Burzynski as the principal investigator, only one has been completed, but it has not been published. Of the remaining sixty trials, the statuses of fifty are unknown; seven were withdrawn; two have been terminated; and one has not yet been opened to accrual (ClinicalTrials.gov 2013), and the phase 3 trial has never accrued a single patient. Merola promised in his movie that Burzynski's phase 2 results will be published "soon," and others claim that Burzynski is preparing at least a dozen manuscripts for publication. However, Burzynski has been promising to publish for years and has not produced anything substantive. This failure to publish is not surprising given the origin of these trials, as we will soon see.

From the late 1970s to 1998, Burzynski was under nearly constant investigation by medical authorities, beginning with the Harris County Medical Society in 1979 (Jaffe 2008; Elias 2009; Null 1979) and continuing with the Texas Medical Board and the FDA. Indeed, the Texas Medical Board has tried to strip Burzynski of his license to practice at least twice, failing to do so in 1993 (Jaffe 2008; Elias 2009) and most recently in 2012 (Gorski 2012). However, it was the prosecution brought against Burzynski by the FDA during the 1990s that spawned the oft-touted "six dozen" clinical trials. Here's how it happened. In the fall of 1995, a grand jury indicted Burzynski for seventy-five counts of insurance fraud and violations of the Food, Drug, and Cosmetics Act. As part of this process, Judge Simeon Lake of the U.S. District Court for the Southern District of Texas, ruled that Burzynski's "continued pretrial release" was contingent upon his administering his drugs exclusively through FDA-approved clinical trials (Antineoplaston Anomaly 1998).

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By this time, however, Burzynski had cultivated powerful allies, in particular Representative Joe Barton (R-Texas), who held a series of hearings featuring cancer patients who were, quite understandably, terrified that Burzynski would be convicted. (Remember, these

patients were completely convinced that Burzynski was the only person who could save them.) Between the cynical political theater, featuring weeping parents of children with brain tumors, national press stories of demonstrations featuring patients chanting "FDA go away! Let me live another day!" and the intense political pressure brought to bear by Barton, who dragged then-FDA Director David Kessler in front of his committee four times over two years to explain why the FDA was "harassing" Burzynski, the FDA ultimately relented and entered negotiations to let Burzynski set up clinical trials. Taking advantage of the ruling and the political pressure on the FDA, Burzynski and Jaffe decided, in essence, "If the judge wants clinical trials, we'll give him clinical trials." So that's just what they did.

Most recently, in response to what is rumored on patient blogs to have been the death of a patient treated with ANPs in 2012, the FDA issued a partial clinical hold on antineoplastons for children, meaning that no new children could be enrolled in Burzynski's clinical trials; the FDA then extended the hold to adults.

Prosecutors pleaded with the FDA not to give in because it would undermine their case, but the FDA overruled them. First, patients already being treated were enrolled in a wastebasket trial known as "CAN-1" (Jaffe 2008; Antineoplaston Anomaly 1998), a retrospective trial looking at all patients then being treated at the Burzynski Clinic. Of this trial, Jaffe (2008) wrote:

> . . . As far as clinical trials go, it [CAN-1] was a joke. Clinical trials are supposed to be designed to test the safety or efficacy of a drug for a disease. It is almost always the case that clinical trials treat one disease.
>
> The CAN-1 protocol had almost two hundred patients in it and there were at least a dozen different types of cancers being treated. And since all the patients were already on treatment, there could not be any possibility of meaningful data coming out of the so-called clinical trial. It was all an artifice, a vehicle we and the FDA created to legally give the patients Burzynski's treatment. The FDA wanted all of Burzynski's patients to be on an IND, so that's what we did.

The FDA also permitted Burzynski to set up nearly identical phase 2 trials for every cancer that he wanted to treat. Burzynski claimed these were based on a protocol used in a trial done by the National Cancer Institute in the early 1990s when the NCI had tried to work with Burzynski. (This effort failed because of strife between the NCI and Burzynski, who viewed the NCI as trying to sabotage the trial (Smith 1992). These trials had but one purpose, to allow Burzynski to continue treating patients with ANPs (Antineoplaston Anomaly 1998), as Jaffe himself boasted (2008):

> CAN-1 allowed Burzynski to treat all his existing patients. That solved the patients' problems, but not the clinic's. A cancer clinic cannot survive on existing patients. It needs a constant flow of new patients. So in addition to getting the CAN-1 trial approved, we had to make sure Burzynski could treat new patients. Mindful that he would likely only get one chance to get them approved, Burzynski personally put together seventy-two protocols to treat every type of cancer the clinic had treated and everything Burzynski wanted to treat in the future.

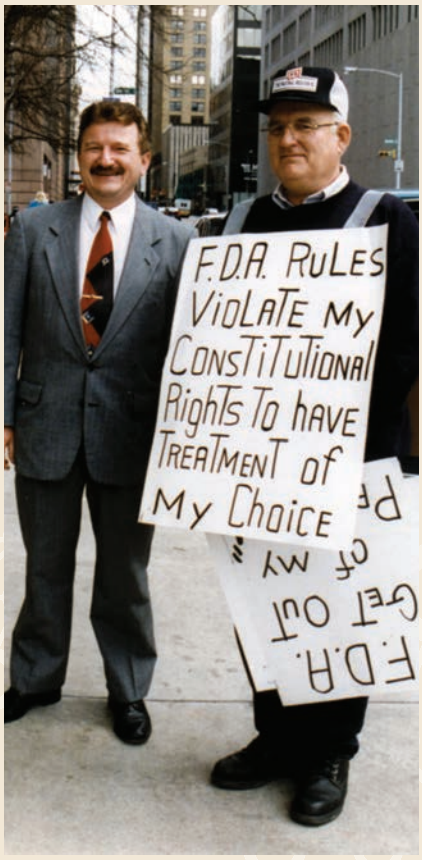
The prosecution thus undermined, the first trial ended in a hung jury in 1997, and a second trial on a subset of the original charges resulted in Burzynski's acquittal. Since then, Burzynski has practiced (mostly) untroubled by the law, other than intermittent FDA inspections and warning letters. Investigations by the FDA in the 2000s resulted in reports citing Burzynski for failure to report adverse events and to follow proper informed consent procedures and a warning letter (US FDA 2009) citing the Burzynski Research Institute (BRI) IRB for deficiencies such as failing to conduct continuing reviews, approving research without determining whether the risks were reasonable compared to potential benefits, and conflict of interest of IRB members. For example, its chair is an old Burzynski crony from Baylor and the current chair of the board of directors of the BRI, Carlton F. Hazlewood.

Most recently, in response to what is rumored on patient blogs to have been the death of a patient treated with ANPs in 2012, the FDA issued a partial clinical hold on antineoplastons for children, meaning that no new children could be enrolled in Burzynski's clinical trials; the FDA then extended the hold to adults. The identity of this child was established in a recent investigative article in *USA Today* to be Josia Cotto (Szabo 2013a). This same article also reported that from January to March 2013, the FDA investigated the Burzynski Clinic. Based on its report (FDA Form 483 2013), the FDA issued a warning letter to the Burzynski Clinic, citing its IRB for, among other violations, enrolling patients in clinical trials without determining that risks to subjects were minimized and were reasonable in relation to anticipated benefits, inappropriately using the expedited review process to treat subjects on single patient protocols, misinterpreting MRI scans to overestimate response to therapy, and destroying original patient records (Szabo 2013a; US FDA 2013b). Until this most recent clinical hold, none of the FDA investigations

had stopped Burzynski from "case management fees" of hundreds of thousands of dollars, even though it is generally considered unethical, except in very narrowly defined cases, to charge patients to participate in a clinical trial. It is, however, not illegal.

Enthusiastic support for Burzynski among the alternative cancer cure subculture is all the more puzzling given that what he is really doing is administering unproven chemotherapy at very high doses. This ANP chemotherapy is not without side effects, contrary to claims otherwise. In addition to causing rashes, fevers, and other side effects, ANPs contain so much sodium that they can cause life-threatening elevations of sodium in the blood. Indeed, Josia Cotto died of hypernatremia, with *USA Today* reporting that he was recorded as having a serum sodium of 205 mEq/L, well into the lethal range (normal is between 135 and 145 mEq/L). Consistent with this, in a June 2013 report on the BBC series *Panorama*, the chief of the pediatric intensive care unit at nearby Texas Children's Hospital related her experiences taking care of patients from the Burzynski Clinic suffering life-threatening toxicity from ANP treatment. In the same report, a parent who took her daughter to Texas Children's Hospital after she had suffered such toxicity reported that the Burzynski Clinic had a very bad reputation there because of the frequency with which they had to care for critically ill and dying Burzynski patients. Despite all the criticism and recent revelations, Burzynski remains combative, referring to his critics as "hooligans" and "hired assassins," while describing the patients who complain about him thusly: "We see patients from various walks of life. We see great people. We see crooks. We have prostitutes. We have thieves. We have mafia bosses. We have Secret Service agents. Many people are coming to us, OK? Not all of them are the greatest people in the world. And many of them would like to get money from us. They pretend they got sick and they would like to extort money from us" (Szabo 2013a).

Less than a month after the *USA Today* report, the FDA issued two more warning letters, citing serious violations, including losing patient records, misclassifying tumor responses, failing to report serious adverse reactions, and advertising antineoplastons as safe and effective even though they were unapproved. The FDA even noted that the medical records of Josia Cotto provided to the FDA Division of Medical Products did not match the medical records that the FDA directors on site had examined (Szabo 2013b).



Jerzy Dabrowski/ZUMAPRESS.com

Dr. Stanislaw Burzynski stands with one of his patients outside a courthouse during a demonstration in his support.

At the close of 2013, Burzynski's allies were replaying their 1990s strategy by recruiting patients with brain tumors to lobby their legislators and persuade others to do the same, patients such as Liza Covad, the wife of Sammy Hagar's drummer; McKenzie Lowe, a girl with a brainstem glioma; and Elisha Cohen, a Houston area boy with a brainstem glioma whose plight has rallied the Jewish community, both here and in Israel, to donate to his cause and write to their elected officials to pressure the FDA to allow them to receive ANPs under a compassionate use protocol.

As 2014 dawned, Burzynski had enlisted the Alliance for Natural Health USA, which duly published "action alerts" smearing *USA Today* and Liz Szabo as in the thrall of pharmaceutical company advertising lucre, insinuating wrongdoing, and trying to rally support to Burzynski patients trying to obtain compassionate use exemptions. Meanwhile, it looks as though the Texas Medical Board will be taking yet another crack at Burzynski in 2014, having filed a complaint in December 2013 charging Burzynski with advertising drugs that are not FDA-approved.

But What about the 'Miracles'?

Patients are drawn to the Burzynski Clinic by reports of "miracle cures," and over the years Burzynski has specialized in treating unresectable brain tumors. Indeed, the Burzynski Patient Group, created in the 1990s, features a website chock full of testimonials of patients with "incurable" cancer who are alive today. Burzynski and his ANPs are, of course, touted as the reason. There can be several reasons why these testimonials are not convincing evidence that antineoplastons cured these patients. For example, many of these patients have had conventional surgery, radiation, and chemotherapy, and it was the conventional therapy that eliminated the tumor. Also, contrary to popular belief, there are occasional survivors of brain cancer. In some cases, it is not clear whether the patient actually had cancer in the first place. In still others, patients have died, but their deaths are not as well known as their testimonials. One famous example occurred in 1988, when television talk show host Sally

Jesse Raphael featured four Burzynski "miracle" patients, who had incurable cancer and failed conventional therapies but claimed that Burzynski had rendered them cancer-free. Four years later, *Inside Edition* followed up on these four patients and found that two of the four had died and a third had recurred, while the fourth had originally had a good prognosis. A more recent Burzynski failure is Christina Lanzoni, who was the sister of model and actor Fabio Lanzoni. At her brother's urging, she sought care at the Burzynski Clinic for advanced ovarian cancer and died in September 2013. Fabio himself has appeared in YouTube videos extolling Burzynski as a "medical genius."

Finally, one potential explanation for some of these seemingly miraculous responses to ANP therapy in brain cancers could come from a phenomenon known as pseudoprogression in which late effects of radiation therapy can produce enhancing lesions that mimic tumor recurrence on brain MRI (Stuplich 2012) and which can occur as much as 28 percent of the time after radiation therapy (Brandes et al. 2008). Such pseudoprogression "tumors" regress over the course of weeks to months, much as "recurrences" treated by Burzynski almost inevitably regress, and pseudoprogression can even persist as long as a year after radiation therapy (Stuplich 2012). While it must be conceded that it is possible that in some patients ANPs might exhibit antitumor effects, the more plausible and parsimonious explanation is that pseudoprogression likely explains many of Burzynski "miracle cures."

'Personalized, Gene-Targeted Cancer Therapy' and Beyond

Burzynski is currently permitted to administer antineoplastons to existing patients, but until the FDA rules based on its most recent investigation he is not permitted to enroll new patients in ANP clinical trials. Perhaps seeing the end in sight for ANPs, over the last several years Burzynski has been "diversifying," in particular treating patients with a protocol he refers to as "personalized gene-targeted cancer therapy" (Somers 2009; Gorski 2011). He has even gone so far as to declare himself a "pioneer" in personalized cancer therapy (Burzynski 2012; Somers 2009). Eric Merola, picking up on this, portrayed Burzynski as such a pioneer in targeted therapy that the University of Texas M.D. Anderson Cancer Center has emulated him with its Institute of Personalized Cancer Therapy, a claim so overblown as to defy belief.

What Burzynski really does has little to do with research or cutting edge cancer therapy. In 2011, I investigated what Burzynski's "personalized gene-targeted therapy" entailed. The spokesperson confirmed what I had learned from patient blogs, namely that he has used a commercial test from Caris Life Sciences, which involves various assays of the patient's tumor and blood plus a gene expression profile of the tumor, and then generates a report of which cancer-associated genes are made by the tumor. For each gene, where applicable, there is a list of drugs that either target that gene or whose antitumor activity correlates with the presence of that gene. More recently, the Burzynski Clinic touts its involvement with a registry study through Foundation One (FMI-001-NGS-500), a company that markets another gene test consisting of a subset of cancer-associated genes, implying that the Burzynski Clinic uses this company's products now.

The problem for cancer clinicians is what to do with these results. What Burzynski claims to be able to do is to use this information to pick a combination of treatments that he can administer at low dose and much less toxicity than conventional chemotherapy. Frequently, these agents haven't been tested together, and the potential for synergistic toxicity is unknown. To apply results like this to patients outside the context of a clinical trial is hard to justify except in rare cases, but that's exactly what Burzynski has done with large numbers of his patients, picking off-label chemotherapeutic agents based on the results of this test and selling it as "personalized gene-targeted therapy" without letting patients know that (1) the relevance of these recommendations is often debatable; (2) the studies used to support them have a lot of uncertainty; (3) few of these recommendations have yet been validated in clinical trials; and (4) it has not yet been shown that using the Caris test or similar tests to direct therapy results in prolonged survival.

After four decades, Stanislaw Burzynski remains an example of a practitioner using unproven cancer "cures" continuously without being shut down for a long period. There is little doubt that Burzynski started out trying to be a real scientist, but something happened in the mid-1970s that led him away from the path of responsible science and medicine. Unfortunately, he remains very good at donning the mantle of science to make it appear as though his therapy represents a reasonable alternative to chemotherapy. Even more amazing, because of his battles with the FDA and Texas Medical Board, he has become a hero in the alternative cancer world, even though ANPs are toxic chemotherapy and his "gene-targeted" therapy is a cocktail of chemotherapies and very expensive targeted agents combined in untested combinations.

Truly, antineoplastons demonstrate the importance of science-based medicine. If Burzynski had "played by the rules" and methodically taken ANPs through the clinical trial process, he (and we) would have known decades ago whether ANPs have significant anticancer activity in humans. In 2014, we still don't know for sure, although what we do know strongly suggests that ANPs have little or no anticancer activity. Finally, Burzynski's story is a cautionary tale of just how ineffectual the medical and government agencies

that are supposed to protect the public, such as state medical boards and the FDA, can be. These organizations are supposed to protect the public from practitioners like Burzynski, but all too often they fail at their charges, in this case spectacularly. ■

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Skeptic Activists Fighting for Burzynski's Cancer Patients

A group of skeptical activists has been aggressively investigating and challenging the false claims of the Burzynski clinic and its dubious cancer treatments, presenting reliable information about them online. They even raised funds for a legitimate research hospital.

One of the most frustrating parts of the thirty-five-year saga of Stanislaw Burzynski is the fact that while it is clear to oncologists and researchers that he has engaged in disturbing business and research practices, legal and professional actions taken to correct the situation have uniformly failed to protect patients. Furthermore, the media have almost entirely ignored the "consumer protection" angle of the Burzynski story, instead focusing largely on "human interest" stories about patients desperately raising vast sums of money on apparently unpublishable clinical trials. (For background information on Burzynski and his claims, see David H. Gorski's article "Stanislaw Burzynski: Four Decades of an Unproven Cancer Cure" in this issue.)

While skeptics cannot perform the protective and punitive roles that regulators and courts have been unable to serve, we can step up and do the investigating, reporting, and editorializing that the media have failed to do. A concerted, sustained effort to do just that began in November 2011, after bloggers Rhys Morgan, Andy Lewis, Peter Bowditch, Popehat, and others received pseudolegal threats from the Clinic's representative, Marc Stephens, a web reputation manager with no legal qualifications. Stephens was sacked when the international media started writing about the story, but over the past year and a half, a core group of about a dozen skeptics have put ever-increasing pressure on the Burzynski Clinic by challenging its false claims whenever they appear online and by promoting reliable information about Burzynski's cancer treatments in ways that are search-engine savvy.[1]

Just as interest in the Clinic's bullying tactics seemed to be waning, in mid-June 2012, the Burzynski affair flared up again. This time, blogger Keir Liddel noticed that a server that hosted several websites of Marc Stephens also hosted jamesrandiusa.org, a new site devoted entirely to smearing skeptics who had been critical of Burzynski (myself included) as pedophiles.[2] Burzynski was on the minds of several skeptics, then, during The Amazing Meeting (TAM) 2012 skeptics' conference that July. There we met Shane Greenup, the developer of rbutr, a browser plugin that adds a layer of meta-commentary to the Internet by linking web pages to rebuttals. I wanted to use this new tool against Burzynski's propaganda machine.

Among Burzynski's most fervent promoters is animator Eric Merola, who released a 2010 movie called *Burzynski: Cancer is a Serious Business*, a conspiracy-tinged hagiography "exposing" Big Pharma and the FDA trying to suppress a cure for cancer, tracing Burzynski's legal battles, and exploiting patients who believe that Burzynski cured them. The film received almost no attention whatsoever before March 2011, when TV's Dr. Oz interviewed Burzynski and Merola on his radio show and *über*-crank Joe Mercola promoted it on his website. From that point on, it seemed to be how most people heard of the Burzynski Clinic. When I returned from TAM, I used rbutr to link Dr. David Gorski's in-depth review of the movie to every single copy I could find on the Internet, over one hundred of them up to this point.[3]

Before TAM, the skeptics who were fighting Burzynski had simply been online acquaintances, but shortly thereafter they initiated the first coordinated attempt to draw attention to Burzynski's pseudoscience by preparing a protest at the clinic. An online group was established on Facebook to put together an effective demonstration, but because cancer patients going to the clinic had enough on their plates without being protested at, we soon decided that we'd protest the Burzynski Clinic by raising funds for St. Jude Children's Research Hospital. We sought to raise $30,000, the cost of starting one of Burzynski's

clinical trials of antineoplastons, and we chose to do it by Dr. Burzynski's seventieth birthday, January 23, 2013. A website, thehoustoncancerquack.com, was set up by the new Facebook group, The Skeptics for the Protection of Cancer Patients (SPCP), to serve as a hub for the protests. The SPCP compiled a suite of resources and links for people who wanted to draw attention to the skeptics' concerns about the Clinic; these resources included guidelines written up by Tim Farley for elbowing reliable information about clinical trials into Burzynski's Google search results.[4]

About two weeks before Burzynski's birthday, writer PZ Myers announced the campaign on his blog, and the fundraising began.[5] James Randi Educational Foundation staff members (especially Brian Thompson and Carrie Poppy) informally advised the campaign. Brian devoted an episode of *Consequence* to the issue,[6] and James Randi, a cancer survivor himself, shared his experiences and spoke up about Burzynski and his ilk on an episode of *The Randi Show*.[7] Rebecca Watson and the Skepchicks led a fundraising team with Rhys Morgan. Journalist and breast cancer patient Xeni Jardin of *Boing Boing* covered the fundraiser. A number of prominent skeptics, including Harriet Hall, Blake Smith, Ben Radford, and Kylie Sturgess, auctioned off skeptical swag on eBay to raise money for the effort. *The Skeptics' Guide to the Universe* devoted a segment to the protest, while Richard Saunders ran promo spots for the fundraiser on *The Skeptic Zone*, and Kylie Sturgess's *Token Skeptic* devoted an episode to the topic. Innumerable skeptics donated time, talent, and money, and on Burzynski's birthday, they delivered to the clinic via certified mail a challenge to match their $14,700 donation to St. Jude. They also sent Burzynski a birthday card. He declined to meet the challenge.

At about the same time, a handful of skeptics started a new website, The Other Burzynski Patient Group (TOBPG). One of the most successful recruiting tools the clinic benefits from

PATIENTS DIE
THE JURY HAS A RIGHT TO KNOW THE TRUTH
SAVES LIVES!
SAVE THE DOCTOR WHO SAVES
Don't Give Us The Death Penalty!!
YOUR FDA IS
Jerzy Dabrowski/ZUMAPRESS.com

A demonstration in support of Dr. Stanislaw Burzynski and his antineoplastons cancer treatment drug.

The parents of Amelia, a little girl with an inoperable, almost universally fatal brain tumor, ecstatically reported online that the center of her tumor was "breaking down." Gorski pointed out that this pattern was far more likely to indicate that the tumor was outgrowing its blood supply, not a sign that treatment was working.

is the constellation of former and current patients who support the Clinic. (The Clinic seems to distribute the contact information of these supporters to prospective patients.) Many of these patients are members of the Burzynski Patient Group, where these patients, most of them alive, share their stories of triumph over cancer. TOBPG, in contrast, collects the stories of the patients who did *not* make it. At present, they have gathered over 550 names of such deceased patients, of which approximately sixty have already been fully researched, written up, and published.[8]

Originally, the idea behind TOBPG was to offer balance to the overly optimistic enthusiasm of the Burzynski Patient Group; we felt it was important that desperate and vulnerable patients encounter something other than uncritical praise of Burzynski. However, the project took on an unexpected importance when a number of disturbing patterns in the patient stories started to emerge. Patients like Denise D., Kathy B., and Supatra A.'s father reported odd billing practices. A far more disturbing pattern emerged after skeptics brought the case of Amelia S. to the attention of oncologist David Gorski. The parents of Amelia, a little girl with an inoperable, almost universally fatal brain tumor, ecstatically reported online that the center of her tumor was "breaking down." Gorski pointed out that this pattern was far more likely to indicate that the tumor was outgrowing its blood supply, not a sign that treatment was working.[9] Amelia died a few weeks later.

Taken by itself, Amelia's MRI results might have been an anomaly, a

one-off misreading of a scan, but when it was put in the context of other patients' stories, something frankly horrifying began to emerge: a pattern of patients (or their parents) reporting that signs of getting worse were symptoms of improvement, often keeping patients on Burzynski's treatment longer than they might otherwise decide to be. In fact, out of the first sixty patients written up, no fewer than seven over a period spanning decades excitedly reported that their tumors were "breaking up in the middle," and many more reported that they were told their worsening symptoms were signs of getting better. When one considers that skeptics have written up only a tenth of the names they have found, and that those in total represent a tiny fraction of the patients who have been treated at the Clinic mostly in the last decade, and that the Clinic has been operating for over thirty-five years, the magnitude of what that place might ultimately represent becomes clear.

I'm off to Houston to see Dr. Burzynski, Dr. Eva and Dr.Yi. I love my Burzynski clinic Angels!!!
Share · Monday at 8:45am
5 people like this.
say hi from me xx
Monday at 8:48am · 1
Will do, Hannah!!
Monday at 9:05am
Me too Sheila, especially Dr Kubova.
Tuesday at 8:52am · 1
Please give Drs B and Eva a big hug from me....one for you too!! xo
Tuesday at 10:05am · 1
Eva Kubove Sweetie, your LDH is normal. I have repeated it and it is still NORMAL!!!!!!!!!!!!!!Love ya!
Tuesday at 4:45pm · 1
Thanks, Dr. Eva!!!!! It was so WONDERFUL seeing you!!!! Love you!!!! XXOO
Tuesday at 5:49pm
Thanks doctor! I love you and your Clinic!
Tuesday at 8:33pm · 2

This screenshot from the Burzynski Patient Group's Facebook page shows one of the doctors at the clinic posting a patients lab results, a clear violation of HIPAA.

At the same time that the Burzynski Birthday Bash was coming together and the websites were going up, patients who felt they had been wronged by the Clinic started reaching out to the bloggers who were writing about Burzynski. Among these patients was Wayne Merritt, one of Burzynski's former pancreatic cancer patients, who was threatened with legal action—called repeatedly at home no less—by not-a-lawyer Marc Stephens.[10] A number of these patients did not know how to seek redress or who to complain to; others simply wanted to share their stories and warn other patients. Skeptics put these patients in contact with one another, with the proper regulatory authorities, and with people who would be able to help them with legal problems stemming from their dealings with the Clinic. We've also reached out to patients who have expressed displeasure to let them know that they are not alone. We've also established good relationships with the Clinic's former employees, upon whom we have relied for putting new information in context. Knowing that most patients who have decided to fundraise for Burzynski will be unlikely to be dissuaded from seeing him, we developed a patient protection checklist for them with tips about documenting their entire experience at the Clinic.[11]

One of the most important things skeptics have been doing has been monitoring the Clinic's public activities on a day-to-day basis and taking appropriate action when events warrant. For instance, when one of the physicians at the Clinic appeared to post a patient's lab results on the Burzynski Patient Group's Facebook page, skeptics grabbed a screenshot (Figure 1) and sent it to the Texas Medical Board to be evaluated as a possible federal HIPAA violation. (Shortly thereafter the patient group blocked all non-members from its page, effectively eliminating another avenue of misinformation.) Another important action skeptics have taken is to monitor the FDA's interactions with the Clinic and to make sure that government agencies that might not be talking to one another are alerted to developments at the Clinic. At the beginning of 2013, the FDA was on the premises for several weeks reviewing Burzynski's clinical trials. When the FDA released the relevant Form 483s (preliminary observations to which the Clinic has a right to respond before any further action is taken), skeptics had them immediately and were horrified by what they read. The inspectors found that the Clinic's Institutional Review Board (IRB), among other things:

- . . . used an expedited review procedure for research which did not appear in an FDA list of categories eligible for expedited review, and which had not previously been approved by the IRB.
- . . . approved the conduct of research, but did not determine that the risks to subjects were reasonable in relation to the anticipated benefits (if any) to subjects, and to the importance of the knowledge that might be expected to result.
- [And that a] list of IRB members has not been prepared and maintained, identifying members by name, earned degrees, representative capacity, and any employment or other relationship between each member and the institution.[12]

Skeptics forwarded all of the currently available Form 483s to the Texas Medical Board, who seems to have opened a new investigation on the basis of these observations. If and when warning letters are released, copies will be sent to the Texas Medical Board and to other professional, state, and federal authorities who might have an interest in seeing such information.

An important development came when Simon Singh contacted the BBC investigative news program *Panorama* and interested them in the story of the Clinic. Numerous skeptics, including Rhys Morgan, David Gorski,

the blogger known as Josephine Jones, and me, were interviewed by phone in the winter and spring, and we put the producers in contact with Wayne Merritt and answered questions relating to the treatment, the patients, and the Clinic. The half-hour episode aired on June 3, 2013, and while some crucial relevant elements—such as the smears and threats leveled against the Merritts and bloggers—were left unaddressed, as well as the decades of suspicious reports from patients, there was no doubt on the show's Twitter stream that viewers were outraged by Burzynski and the fact that he has been allowed to extract money from the dying for so long.[13] Even papers in the United Kingdom that had previously advertised fundraisers to send desperate patients to Burzynski revisited the story and informed readers that the patients who they've sent to Burzynski feel like they were "misled."[14]

Skeptics also attended every North American pre-release screening of Eric Merola's sequel about Burzynski, where they took copious notes, usually asked challenging questions, and generally gleaned useful information not only about the movie itself but also about the perspectives and activism of Burzynski's supporters. This allowed skeptics with more experience with Burzynski's shenanigans to prepare rather detailed responses to the movie even before it was widely available. At one of these showings, the director mentioned that members of the Burzynski Patient Group were preparing to launch a public awareness campaign called "ANP for All." Skeptics immediately scooped up the Facebook page and Twitter feeds, as well as the URLs ANP4all.com and ANP4all.org, effectively hobbling the launch of that misguided venture. The replacement site, iwantanp.org, is now trademarked.

The results of this ongoing, ever-intensifying skeptical campaign are not yet complete. In its first year, The Other Burzynski Patient Group has surpassed the number of stories that it took Burzynski nearly forty years to accumulate. The same bloggers and activists who have worked the Burzynski story so hard for the last year and a half have no intention of letting up, and new tales from the Clinic come to us daily.[15] Last, and most crucial, the Skeptics for the Protection of Cancer Patients are using a November 15 exposé of the Burzynski Clinic on the front page of *USA Today* and the recently released results of an abysmal site review by the FDA (and the subsequent warning letters) as an opportunity to press Congress to investigate how Burzynski managed to secure permission for phase 3 clinical trials without having ever published a single phase 2 trial. The SPCP encourages all skeptics to visit thehoustoncancerquack.com to find out how to lobby their representatives most effectively.

Burzynski's supporters have publicly wondered whether Burzynski should leave the United States. A recent SEC filing reported that patient visits were down in the past year, an encouraging sign, to be sure.[16] Nonetheless, these efforts have not been without some consequences for the skeptics involved. Skeptics have been so effective that Eric Merola's most recent Burzynski hagiography spends a lot of screen time demonizing critics. Burzynski's supporters have contacted our employers, have complained to state licensing boards, and defamed a number of us publicly. We are fully aware that when the Clinic dismissed Marc Stephens that it pointedly failed to retract the possibility of lawsuits against critics, a threat that hangs over all of these activists every day. If skeptics' concerns are founded, however, the risks to activists pale in comparison to the risks already posed to those patients on whose behalf we are working. ■

Notes

1. By far the most comprehensive online resource regarding Burzynski's career and practice is maintained by the blogger known as Josephine Jones at http://bit.ly/sDYDRg.

2. Hill, Sharon. 2012. "Vicious Web Site Attacks Prominent Skeptic James Randi and Others." Doubtfulnews.com (June12). Available at http://bit.ly/14ECsVn.

3. Greenup, Shane. 2013. "Our First Rebuttal to Reach 100 Rebuttings!" Rbutr.com (May 4). Available at http://blog.rbutr.com/2013/05/our-first-rebuttal-to-reach-100-rebuttings/.

4. These search engine optimization strategies, skeptics' most powerful tool of combating misinformation, may be found at http://bit.ly/18NXNxJ.

5. Myers, P.Z. 2013. "Let's Make Houston Cancer Quack Burzynski Pay!" *Pharyngula* (January 6). Available at http://bit.ly/UZ0XYc.

6. Thompson, Brian. 2013. "The Burzynski Clinic." *Consequence: True Stories About False Things* (January 14). Available at http://bit.ly/VFVbLo.

7. "The Burzynski Clinic and Cancer Quacks." 2013. *The Randi Show*. (January 11). Available at http://bit.ly/19R9Mvd.

8. Among the most revealing patient stories at theotherburzynskipatientgroup.wordpress.com are those of Amelia S. (http://bit.ly/1aVX1LI), Denise D. (http://bit.ly/12quzSf), and Chase S. (http://bit.ly/16SgNv2).

9. Orac. 2012. "More Sad News About a Burzynski Patient." *Respectful Insolence* (December 12). Available at http://bit.ly/ZgXsyI.

10. "Cancer Patients Threatened." 2012. The Other Burzynski Patient Group (June 3). Available at http://bit.ly/14aTc0Y.

11. "Advice for Burzynski Patients." n.d. The Other Burzynski Patient Group. Available at http://bit.ly/18NIGnS.

12. "FDA Inspection (FOIA Requests, Feb 2013)." n.d. The Other Burzynski Patient Group. Available at http://bit.ly/16yFNDc.

13. "Cancer: Hope for Sale?" 2013. *Panorama* (June 3). Available at http://bit.ly/11ruWKJ.

14. "Amelia's Family 'Misled by Cancer Clinic.'"2013. *Reading Post* (June 5). Available at http://bit.ly/1bdQTkV.

15. I'd be remiss if I did not mention the work that the Guerilla Skeptics have done to keep the Wikipedia page about Burzynski up to date and translated into several languages.

16. This filing is publicly available at the SEC website at http://1.usa.gov/1aB1oeT.

Robert J. Blaskiewicz, a writing teacher in Wisconsin, writes the "Conspiracy Guy" web column for the CSI website, blogs at skeptical humanities.com, edits a series on critical thinking in education on the JREF's *Swift Blog*, contributes a monthly essay about skepticism and the humanities to the *Skepticality* podcast, and appears as a regular panelist on the weekly Google+ OnAir web show *The Virtual Skeptics* (Wednesdays, 8 PM EST, virtualskeptics.com). He also writes for The Other Burzynski Patient Group (theotherburzynskipatientgroup.wordpress.com), where skeptics have collected the stories of patients who did not make it.

What Is the Danger that Terrorists Will Attack the United States with a Nuclear or 'Dirty' Bomb?

While the detonation of a nuclear device by terrorists in the United States would be catastrophic, the danger of that happening has been vastly overblown—and the ominous "dirty bomb" is little more than folklore.

RICHARD E. WACKROW

Since the September 11, 2001, terrorist attacks on the United States, two swords of Damocles have been dangled over the heads of Americans: the possibility of either a nuclear bomb or a "dirty bomb" being detonated on U.S. soil. Even the explosion of a "small" nuclear device (comparable to the one dropped on Hiroshima, Japan, in 1945, which killed more than 100,000 people) would be devastating. And a dirty bomb, if it worked as advertised, would kill thousands. I examine the actual dangers posed by these devices and look at some of the measures being taken to prevent each scenario.

The Nuclear Threat

Although Osama bin Laden had made it clear that he wanted to attack the United States with nuclear weapons, the obstacles to pulling off such an attack make the deed more difficult to accomplish than government officials and an often-credulous media have portrayed. Michael A. Levi, a fellow at the Council on Foreign Relations, put the threat of nuclear terrorism in the United States into perspective:

> Here's the reality. The nuclear threat is real and deserves our utmost attention. An atomic bomb detonated in the heart of a major American city could kill hundreds of thousands. But it would be tougher for terrorists to pull off a nuclear attack than many people assume. . . . Many intelligence professionals know that, but our political culture doesn't do moderation. The first step to getting smart about defense, then, is to bust some popular myths about nuclear terrorism. (Levi 2008)

Would-be nuclear terrorists face myriad technical and strategic obstacles: funding the plot, recruiting competent nuclear expertise, acquiring a sufficient supply of the appropriate fissionable material (enriched uranium-235 and plutonium are the industry standards), smuggling it (or other bomb components) into the country, machining a functioning bomb—all while avoiding detection by intelligence agencies, border guards, police, informants, and alert citizens.

To acquire fissile material, Levi writes, terrorists would "probably target a nuclear facility directly, maybe a military base in the former Soviet Union or a civilian reactor in an obscure corner of the world. That's a big reason why we need to do a much better job of securing those sites." However, despite reports of unattended nuclear bombs and materials in the former Soviet Union (Borger 2010), and the success of Pakistani nuclear scientist A.Q. Khan in building a worldwide black market in nuclear technology (not to be confused with peddling fissile U-235 or plutonium [Warrick 2009]), the black-market acquisition of the appropriate fissionable nuclear material has its pitfalls: The materials would cost millions of dollars (the funding problem), and such transactions are often subject to sting operations by intelligence authorities (introducing the risk of arrest).

To be used as the fissile core of a nuclear device, U-235 has to be enriched to at least 90 percent purity. The minimum amount of enriched U-235 necessary to create a nuclear bomb is about fifteen kilograms (Dean 2006). Much less plutonium is required to fashion a functioning bomb (as little as four kilograms), but such a device is considerably more complicated and difficult to build. And engineering a nuclear device from scratch (or assembling one piecemeal, for that matter) is far more difficult than terrorism mavens tend to acknowledge.

A mock "dirty bomb" is detonated during the Department of Homeland Security's TOPOFF4 disaster preparedness exercise in Portland, Oregon, October 16, 2007. The exercise was held in conjunction with events in Guam and Phoenix, Arizona, to test federal, state and local preparedness for attacks.
Reuters/Richard Clement (United States)

The minimum amout of enriched U-235 necessary to create a nuclear bomb is about fifteen kilgorams.

In May 2002, Jose Padilla was arressted and accused of planning to build and detonate a radioactive "dirty bomb" in the United states. He was convicted of lesser charges.

While the likelihood, then, of a nuclear device being detonated in a major U.S. city is technically remote, the horrendous loss of life and property, and the damage to the U.S. economy resulting from such an attack warrant serious-but-considered attention. A conscientious cost-benefit analysis is in order—balancing the likelihood of such an attack with its egregious consequences and the monetary, commercial, and civil liberties costs associated with its prevention.

International efforts are being made to restrict access to fissile materials. Organizations such as the International Atomic Energy Agency and the Nuclear Threat Initiative are constantly working to control the proliferation of black-market nuclear weapons and fuels. And in April 2010, Barack Obama persuaded fifty world leaders attending a summit meeting to pledge to secure all vulnerable nuclear material within four years (Borger 2010). However, much pilfered nuclear material is suspected of having been in the wrong hands for years. So preventing its ultimate entry into the United States remains a concern.

Uranium-235 is safe to handle and smuggle in a lead-lined container. In October 2006, government agents successfully smuggled enriched U-235 across the Canadian border into the United States in three out of four attempts ("Obstacle course" 2007), causing lawmakers and the George W. Bush administration to question the sparse coverage of the 4,000-mile border between Canada and the lower forty-eight states by U.S. Border Patrol agents. Following 9/11, Border Patrol manpower along the northern border has increased from 342 agents in fiscal year 2001, to 919 agents in FY 2006, to 2,237 agents in FY 2011 (U.S. Customs and Border Protection 2012).

The motives of Congress and the Department of Homeland Security for this increase in manpower might very well have been pork-barreling and "security theater" as much as enhancing national security. And given the fact that illegal aliens continue to flow into the country across the United States' much-more-heavily-manned southern border, which in FY 2011 was covered by 18,506 agents (U.S. Customs and Border Protection 2012), it is doubtful that this increase in agents along the Canadian border would prevent the entry of a savvy interloper toting a package of U-235.

The most practical way of smuggling nuclear materials into the United States from Canada would be to conceal them in commercial vehicles passing through border stations—after they were successfully smuggled across Canada's heavily monitored coastlines. This type of security requires a balancing act between intercepting nuclear materials and unduly impeding the copious commerce between the United States and Canada. Radioactive material is widely used in industrial and health-care applications. Screening vehicles for possible radiological weapons would create a fractious number of false positives.

Levi knows how genuine-but-unlikely terrorism scenarios can be overblown for dramatic effect. Just prior to the 2008 presidential election, he wrote:

> Politicians love to scare the wits out of people, and nothing suits that purpose better than talking about nuclear terrorism. From President Bush warning in 2002 that the "smoking gun" might be a mushroom cloud, to John Kerry in 2004 conjuring "shadowy figures" with a "finger on a nuclear button" and Mitt Romney invoking the specter of "radical nuclear jihad" last spring, the pattern is impossible to miss. Indeed the three-part political strategy is simple. Describe the havoc an attack would wreak. Suggest that without big changes to American strategy, a successful strike is pretty much inevitable. And now that you have people's attention, deliver the closer: You have a foolproof plan for eliminating the threat. (Levi 2008)

The Dirt on 'Dirty Bombs'

In May 2002, Jose Padilla, a Hispanic U.S. citizen who had converted to Islam, was arrested in Chicago and accused of planning to build and detonate a radioactive "dirty bomb" in the United States. He was arrested on U.S. soil long before he could have carried out his alleged plot. In fact, he was never charged with the crime of plotting to use a dirty bomb. Eventually, he was convicted on lesser charges related to providing material support to terrorism and plotting mass murder, and sentenced to seventeen years in prison.

The notion of Muslim terrorists attacking the United States with a dirty bomb was planted by Abu Zubaydah, an associate of Osama bin Laden. Zubaydah was captured in Pakistan in March 2002 (and at the time of this writing he remained in captivity at Guantánamo, Cuba). That possibility was eagerly accepted by the early Bush administration and the media (Curtis 2004). But despite the fact that there never has been such a plot, the specter of terrorists using

A file photo dated 04 February 2004 shows Pakistani top nuclear scientist Abdul Qadeer Khan appearing on the state television PTV to confess and apologize for leaking nuclear secrets to other countries.

"Weapons of mass destruction, including those containing chemical, biological or radiological agents or materials, cannot be discounted."
—former Homeland Security Secretary Tom Ridge

a dirty bomb remains etched in the minds of Americans today.

A dirty bomb is an explosive device that, according to terrorism folklore, will someday disburse nasty stuff—in most scenarios, radioactive material or a biological agent, such as anthrax spores—using a simple large explosion, thereby inflicting mass casualties. In 2003, Levi, a former science and technology fellow in foreign policy studies at the Brookings Institution, took Bush administration officials to task for irresponsibly miscategorizing the dirty bomb as a weapon of mass destruction:

> Most flagrantly, Atty. Gen. John Ashcroft, announcing the arrest of suspected dirty-bomber Jose Padilla on June 11, 2002, incorrectly declared, "a radioactive 'dirty bomb' involves exploding a conventional bomb that not only kills victims in the immediate vicinity, but also spreads radioactive material that is highly toxic to humans and can cause mass death and injury."
>
> And … announcing the new orange terror alert, Homeland Security Secretary Tom Ridge remarked, "Weapons of mass destruction, including those containing chemical, biological or radiological agents or materials, cannot be discounted." (Levi 2003)

In reality, the theoretical dirty bomb should more rightly be called a "weapon of mass *disruption*," not a weapon of mass *destruction* (U.S. Nuclear Regulatory Commission 2010). A dirty bomb would likely kill only those in immediate proximity to the initial explosion. Such a device would contaminate an area commensurate with the strength of the explosion it produced (from a few square meters to several city blocks). The depth of contamination would depend on the type and amount of the agent that it disbursed (its degree of radioactivity and particle size, for example).

As for volatile biological agents being disbursed by a dirty bomb or other means, writes Levi, "plague, while able to kill in vast numbers if left untreated, can be halted by a seven-day course of antibiotics" (Levi 2003). In the case of the September 2001 anthrax attacks in the United States—which infected some twenty-two people with concentrated doses of anthrax virus, killing five of them—letters containing virus were mailed to *selected desired individual victims*. This can hardly be classified as a biological attack designed to inflict mass casualties.

I checked numerous credible, credentialed sources on the subject of dirty bombs and arrived at the following compendium of largely concurring opinions about them:

- A radiological dirty bomb can be built to disburse any number of substances that are produced in nuclear reactors: strontium-90, americium-241, cesium-137, cobalt-60, iridium-192, plutonium-238. But the more-volatile radioactive materials can kill even an intentional suicide bomber before he has built and exploded the device.
- These materials are becoming more and more difficult to obtain. From the U.S. Nuclear Regulatory Commission (NRC): "Most reports of lost or stolen material [in the United States] involve small or short-lived radioactive sources that are not useful for a [radiological disbursal device]. Past experience suggests there has not been a pattern of collecting such sources for the purpose of assembling a [dirty bomb]. It is important to note that the radioactivity of the *combined total of all unrecovered sources over the past 5 years* [emphasis added] . . . would not reach the threshold for one high-risk radioactive source" (U.S. Nuclear Regulatory Commission 2010).
- More skill is involved in building an effective radiological dirty bomb than we have been led to believe.
- Disbursal of a radioactive substance would be determined by factors such as wind speed and direction. Immediate exposure of potential victims would be mitigated by such factors as their being in and around buildings when the device exploded.
- The primary step to limiting human injuries from radiation is quick evacuation of the affected area. It is highly unlikely that victims in the bomb's range would absorb a lethal dose of radiation before they could leave.
- Controversy surrounds the amount of radiation that can be harmful to humans, but qualified experts seem to agree that the danger has been exaggerated. Even the largest dirty bomb is likely to inflict significant casualties only if long-term cancer risks are considered.
- Opinions vary regarding the ease and speed with which a contaminated area could be cleaned up, and when people could safely return to the area.
- The strategy for dealing with a dirty bomb should include public information (to inform the public how to react and to quell panic); a national, coordinated first-response structure; expertise in the appropriate emergency medical care.

A dirty bomb, in fact, has never been successfully deployed to inflict human casualties or terror. In 1987, the Iraqi military tested such a device. Following the Septem-

Despite congressional criticism, then-DHS Secretary Janet Napolitano, in an April 2011 DHS blog post, touted the Securing the Cities program, saying that it "has provided more than 5,800 pieces of detection equipment, trained nearly 11,000 personnel, and conducted more than a hundred drills. . . . Following an evaluation of the initial pilot, President Obama's FY 2012 budget request outlines a transition from a pilot program to a more permanent capability that could be . . . replicated in other major metropolitan cities."

ber 11, 2001, attacks, the U.S. Department of Energy's Sandia National Laboratories in New Mexico experimented with basic dirty-bomb designs (using innocuous materials with the same disbursal properties as would-be radioactive agents, of course). The U.S. Defense Department also ran tests (Hanley 2010). In all three cases, it was concluded that a dirty bomb would not inflict mass casualties (Curtis 2004).

What I will consider the last word on this subject comes from the Department of Homeland Security (DHS). In its July 2010 United States-Canada Joint Border Threat and Risk Assessment (U.S. Department of Homeland Security 2010), the agency both invokes the specter of Al Qaeda's continuing intentions to use chemical, biological, radiological, and nuclear (CBRN) materials in terrorist attacks and proffers a realistic appraisal of the probable success of such efforts:

- Chemicals are generally the least difficult of CBRN materials to acquire; however, it is considered technically challenging for a su state group to develop stable, high-quality chemical agents in sufficient quantity to implement a mass-casualty attack.
- One of the greatest challenges in creating an effective biological weapon is keeping the agent viable during dissemination.
- Although [a radiological disbursal device] is unlikely to cause many fatalities due to acute radiation, an RDD attack could contaminate a large area, rendering it inaccessible until significant decontamination has occurred.
- The critical challenge for a terrorist group remains acquisition of a sufficient quantity of fissile material, or acquiring a useable weapon from state inventories.

Rethinking the Danger

Perhaps because of a more rational assessment of the threat of nuclear terrorism, the U.S. Congress has begun questioning the cost-effectiveness of security programs ostensibly designed to prevent a nuclear attack on a U.S. city. In 2008, *Washington Post* reporter Spencer S. Hsu wrote:

> At an estimated cost of $90 million, the Securing the Cities program [a pilot nuclear-materials-detection effort in New York City, Connecticut, and New Jersey] absorbs a small fraction of the Bush administration's overall national security and counter-proliferation expenditures. But critics have raised questions about its value, noting its rapid growth in the absence of a specific threat of urban nuclear terrorism, as well as the program's technical challenges and operational limitations.
>
> Its aims, Senate appropriators warned in a report last year, may be technologically unfeasible. The attempt to create a detection system in New York as a model for other cities is based on assumptions "that run counter to current intelligence in this threat arena, and *has no measure of success, nor an end point*," [emphasis added] they said. (Hsu 2008)

Despite congressional criticism, however, then-DHS Secretary Janet Napolitano, in an April 2011 DHS blog post, touted the Securing the Cities program, saying that it "has provided more than 5,800 pieces of detection equipment, trained nearly 11,000 personnel, and conducted more than a hundred drills. . . . Following an evaluation of the initial pilot, President Obama's FY 2012 budget request outlines a transition from a pilot program to a more permanent capability that could be . . . replicated in other major metropolitan cities" (Napolitano 2011).

Despite the science, the fanciful terrorism scenarios proffered in the early post-9/11 years linger in the mind of the public. And the ever-growing counterterrorism strategy and infrastructure of the United States continue to be predicated on a gross overestimate of the technical prowess of our enemies.

Conclusion

Given what we have learned from reputable experts, including those in government agencies such as the NRC and DHS, we have to conclude that the likelihood of Americans being killed by a nuclear or dirty bomb deployed by terrorists is vanishingly small. Acquisition of an adequate supply of fissile radioactive material, virulent biological agent, or potent toxic chemical, and the construction of a device adequate to perform the intended deadly deed are beyond the reach and the acumen of even the most dedicated jihadist. But despite the science, the fanciful terrorism scenarios proffered in the early post-9/11 years linger in the mind of the public. And the ever-growing counterterrorism strategy and infrastructure of the United States continue to be predicated on a gross overestimate of the technical prowess of our enemies.

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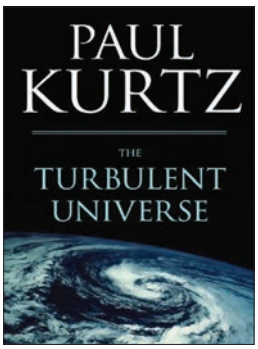
A Philosophical Mind Considers the Universe (and Us)

KENDRICK FRAZIER



The Turbulent Universe. By Paul Kurtz. *Prometheus Books, Amherst, NY, 2013. ISBN: 9781616147358. 259 pp. Paperback, $20.00.*

At the conclusion of the October 2003 CSICOP conference "Hoaxes, Myths, and Mania" in Albuquerque, I invited our founding chairman, Paul Kurtz, and other members of the Executive Council up to my house to view the clear night sky through my new eight-inch telescope. With the help of an astronomer colleague, we viewed Mars and Saturn, our neighboring Andromeda galaxy, and other more distant galaxies and nebulas. It was wondrous.

Paul was transfixed, delighted, joyous. You could tell he felt a sense of wonder and a connection to our cosmos. For years thereafter when we talked he would recall that evening with special pleasure.

Some of that same sense of delight in the wonders of nature and our physical universe drives his posthumously published book, *The Turbulent Universe*. It is, I believe, his most science-oriented book. In fact he opens with a chapter titled "Pondering the Night Sky," as he writes from his study in a chateau overlooking a small French village and reliving his views of galaxies, stars, and planets.

Although Kurtz's enormous breadth of interests and passions should never surprise us, they continue, in this final book, to do so. Here is the philosopher and great humanist and skeptic leader encountering the natural world. At that 2003 conference he said we skeptics were naturalists, "committed to scientific naturalism," and moved by "a grand scientific adventure" to feel "the deepest awe." Much of *The Turbulent Universe* is written in that spirit.

Kurtz calls his book a treatise not only on nature but also on the human condition. "What is the place of human beings in the orderly yet random universe?"

Early on he introduces his key theme: "We live in a beautiful and elegant universe—as viewed from the deepest laws of nature discovered by science. Yet at the same time, we find it to be a universe in which contingency, chance, dissonance, individuation, historicity, emergence, and novelty are ever present." In spite of such uncertainties and unpredictabilities, "humans are capable of making moral choices, and the future of the human adventure depends in some measure on how we respond to the challenges encountered in a random universe" (17).

He calls his book a treatise not only on nature but also on the human condition. "What is the place of human beings in the orderly yet random universe?" (30). But first, nature. He surveys what we have discovered about the physical universe, the biosphere, and the human sphere. He reviews atomic theory, describes the four forces of nature. In a continuing subtheme, he considers physicalist reductionism. Here his inquiries lead him to side not with arch-reductionist physicist Steven Weinberg that everything is reducible to physics and chemistry but with the

more nuanced view of physicist Murray Gell-Mann and others who acknowledge chance, contingency, and emergent properties that need to be studied at other levels of analysis to truly understand nature and ourselves.

"Wherever we can we should seek the most basic physical-chemical explanations possible," Kurtz writes. "What we should *not* do is exclude explanations from other sciences that may be relevant but that are not physicalist in a strict sense" (81). He has sections on the birth of the sun, the emergence of our solar system, the origin of Earth, great supernova explosions, dark matter, and the idea of multiple universes. Most of his approach is survey and overview, but sometimes he delves into surprising detail. If you want to know the names of all the moons of Jupiter, there they are, listed in Note 19 on page 257.

"Some reverence on our planet for nature is fitting," he says. "It is both *human* and *natural*, and it should not be confused with the worship of mythical gods enshrined by the ancients." He acknowledges that "some atheists may be incensed by these remarks, but if they are, they are insensitive to the magnificent splendor of the universe . . ." (100).

Kurtz writes about contingency and chance in the biosphere, past extinctions, plentitude and waste in the Amazon rainforest, the fecundity of nature with its overabundant production of spores, sperm, seeds, and eggs, "very few of which will survive." He gets almost rhapsodic about sounds, colors, and the evidence of reproduction, birth, growth, and death he himself observed during a trip to the Amazon.

"I reiterate," he writes, "it is of no concern to nature at large what lives or what dies because there are no discernible fixed purposes in the order of nature." But he quickly adds, and this is the point of his philosophical inquiry, "it matters enormously to those whose lives are the central drama played out on a moving stage" (36).

He has an entire chapter on adaptation and evolution, with subsections on natural selection, human evolution, and sexuality and love.

One of the more challenging chapters, "The Effervescence of Emergents," further extends his inquiry. He lauds our "methods of scientific corroboration continuous with common sense" by which we can "ascertain what is true independently of our subjective fancies or cultural mythologies." He soon is exploring emergent properties, which produce novelty in nature, and again emphasizing the need to consider nature at a series of levels: from atoms, to organisms, to ecosystems and then the social systems that living beings form, from families, to tribes, to communities, and eventually to cultures and civilizations.

"I reiterate," he writes, "it is of no concern to nature at large what lives or what dies because there are no discernible fixed purposes in the order of nature."

Soon Kurtz is considering contingency in conflict and human affairs, beginning with biogenetic and cultural coevolution and extending to the rise and fall of civilizations. He considers the Greek and Roman civilizations, the wars of the twentieth century, the decline of the French empire after World War II, and adds an interesting "Postscript on the USA."

Now he has reached his overarching concern with "*planetary ethics*, incorporating the wisest and most sensible norms of cultural behavior that humankind has evolved." This is what Kurtz devoted his later years to advancing. Whether his proposed world institutional solutions (e.g., an elected planetary parliament) are naïve (as some certainly think) or just decades ahead of their time—well, only time will tell. But he can never be accused of thinking small.

In a chapter titled "Moral Choices in a Random Universe," Kurtz insists that moral choice is a key ingredient in a contingent universe and "is an emergent quality that has defined human civilization, a Promethean leap ahead, the courage to become who and what we are, at least in some sense" (203). In "Order and Harmony in the Universe," Kurtz presents a series of arguments and counterarguments in which he pits his positive idealism about how he wishes society to be against practical realities, contingent events, and human shortcomings.

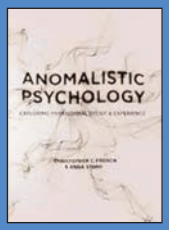
But in his grand finale chapter he reiterates what he calls "the exultant… lust for life" and "an affirmative attitude of good will" along with reverence for nature. In the end he returns to where he began, pondering the physical universe (251).

"Whatever we must do, we must never forget to look up and stargaze, and this can but only arouse a new sense of awe about nature and a kind of profound reverence for life that is born of it. That best response we can give is not supplication but buoyancy: to enjoy every moment that we can, to exult and extol the natural world, and to live as fully as we can, realizing our highest talents for creativity and fulfillment." ■

Kendrick Frazier is editor of the SKEPTICAL INQUIRER.

[NEW AND NOTABLE

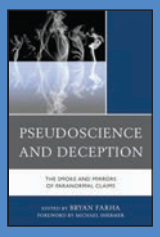
Listing does not preclude future review.



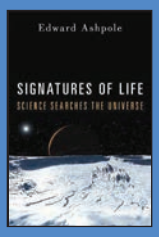
ANOMALISTIC PSYCHOLOGY: Exploring Paranormal Belief and Experience. Christopher C. French and Atta Stone. A comprehensive overview of thinking and findings in the relatively new field of anomalistic psychology—the attempt to explain paranormal and related beliefs and ostensibly paranormal experiences in terms of known (or knowable) psychological and physical factors. Psychologists French (head of the Anomalistic Psychology Research Unit at Goldsmiths, University of London and a CSI Fellow) and Stone (senior lecturer at the University of East London) hope the book will be useful to the general reader and to students in courses on anomalistic psychology, parapsychology, and critical thinking. Palgrave/Macmillan, 2014, 232 pp., $37.95.

THE BOOK OF MIRACLES. Till-Holger Borchert and Joshua P. Waterman. A lavishly illustrated manuscript titled *Augsburg Book of Miraculous Signs* was created around 1552 and eventually lost to obscurity. Recently rediscovered, this book (reissued by art publisher Taschen) contains 169 full-color gauche and watercolor facsimile pictures depicting everything from monsters to unusual celestial events (such as the Sun "sweating blood," as one illustration and caption claims happened in 938 CE). An accompanying book describes each print and explains its significance, providing a unique and fascinating historical look at how sixteenth-century Europeans interpreted signs from God. Taschen, 2014, 568 pp., $100.

MEMES IN DIGITAL CULTURE. Limor Shifman. Shifman, a senior lecturer in communication and journalism at Hebrew University, examines Richard Dawkins's conception of memes in digital culture. Her inquiry ranges from what makes YouTube videos memetic (Psy's worldwide hit "Gangnam Style" video is analyzed) to cute animal videos and other photos widely shared on social media sites. An interesting blend of science and pop culture. The MIT Press, 2013. 200 pp., $13.95.



PSEUDOSCIENCE AND DECEPTION: The Smoke and Mirrors of Paranormal Claims. Edited by Bryan Farha. An expanded (eight new chapters) edition of an excellent academic "reader" of invited articles (some from SI) regarding pseudoscientific, extraordinary, or unexplained phenomena, first published in 2007 under the title *Paranormal Claims, a Critical Analysis.* It includes "some of the most classic, historical, and eye-opening skeptical articles pertaining to extraordinary claims." Forward by Michael Shermer. University Press of America, 2014, 173 pp., $29.99.

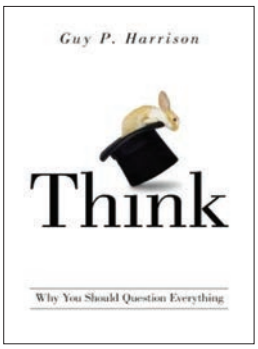


SIGNATURES OF LIFE: Science Searches the Universe. Edward Ashpole. A science writer's examination of the difficulties inherent in the as yet unsuccessful search for extraterrestrial intelligence (SETI) and possible reasons for the null result after fifty years of trying, plus consideration of other promising avenues for the search. Ashpole calls for imaginative new strategies of search and hypothesis-testing and contrasts that with most of what is published about UFOs, which is "unscientific and unreliable—and even outright baloney." Prometheus Books, 2013, 227 pp., $25.

—Kendrick Frazier and Benjamin Radford

How to Think about Appealing Claims

KENNETH L. FEDER



Think: Why You Should Question Everything.
By Guy P. Harrison.
Prometheus Books, Amherst, New York, 2013.
ISBN 978-1-61614-808-9. 240 pp. Softcover, $16.95.

You are almost certainly familiar with the old saw, "Give a man a fish, and you have fed him for a day. Teach a man to fish, and you have fed him for a lifetime." This adage comes to mind when reading Guy Harrison's terrific, useful, well-written, and just plain entertaining new book, *Think: Why You Should Question Everything*. In its application here, we might rephrase it to: "Debunk a pseudoscientific claim and you might disabuse your reader of the validity of that particular claim for a day. Teach your reader how to think critically, provide him or her with the intellectual tools necessary to assess assertions or claims about how the world works, and you can inoculate that reader against nonsense on a far broader and deeper level and for a lifetime." *Think* does precisely these things, and does so in an entertaining fashion.

Think is not a debunking book at its heart. Sure, Harrison does an admirable job of briefly deconstructing all of the usual suspects: ancient astronauts, astrology, Atlantis, flying saucers, ghosts, homeopathy, Nostradamus, and a host of others. The many sections of Chapter 3 succinctly accomplish much of that heavy lifting. But Harrison's approach—and his realized goal—extends far beyond setting

up and knocking down an extensive checklist of pseudoscientific claims. *Think*, as you might suspect from the title, is about, well, thinking.

Harrison does not set himself up as an authority on all things paranormal, occult, extreme, and extraordinary and then debunk the claims one by one. Instead, his focus is on how to scientifically—and yes, skeptically—assess any claim or hypothesis, extraordinary or otherwise. Time and time again in the book, Harrison agrees that he can't necessarily disprove extreme claims, and that he won't rule out the possibility that evidence may one day be collected that supports the validity of ESP or the historicity of the ancient aliens hypothesis. Further, he concedes, time and time again, that it would be exceptionally cool if any such proof were to be produced. A giant, bipedal primate prowling the deep woods of the American Northwest? Bring it on! Your deceased ancestors returning in spectral form to share their stories with you? Awesome! Extraterrestrial aliens visiting Earth in antiquity and playing an active role in the technological progress of past peoples? Beyond cool! The question is not, as Harrison maintains, whether such hypotheses are interesting or engaging or intriguing. Of course they are. The important question remains: Is there any credible evidence to support such claims? Harrison does not simply say "No." He explains how the evidence supplied (at least so far) is woefully insufficient to support these claims.

There is another important thread running through *Think* that should be lauded here. Skeptics are often viewed by the less skeptically inclined as, essentially, prissy party poopers. Skeptics are forever raining on everyone else's parade when it comes to intriguing, game-changing views of history, zoology, the human mind, mortality, and even reality itself. We're fuddy-duddies and curmudgeons, naysayers and rejectionists. We're out to ruin everyone's good time because we simply don't want to believe this stuff. We want the world to be predictable, boring, and mundane. Harrison debunks this libel against skeptical scientists when he points out that, in reality, the folks who would be the most jazzed by proof of extraterrestrial visits, Sasquatch, ESP, and the like are the very professional scientists whose fields of study would be most directly impinged upon by that proof. Because of an abiding interest, both professional and personal, in human evolution, a fascination with apes, and an obsession with the movie *Planet of the Apes* Harrison asserts that no one, not even the most fervent cryptozoologist, would be as thrilled as he by the discovery of a real live Bigfoot.

The important question remains: Is there any credible evidence to support such claims? Harrison does not simply say "No." He explains how the evidence supplied (at least so far) is woefully insufficient to support these claims.

I think Harrison is spot on about this. Though I never had the privilege of meeting Carl Sagan, I have read most of his books, watched *Cosmos* (about ten times!), and have seen many of his television interviews. And I am dead certain that though he was highly skeptical about it, no one would have been more tickled than he would have been had definitive proof been presented that extraterrestrial aliens were joyriding around our planet in interstellar spacecraft.

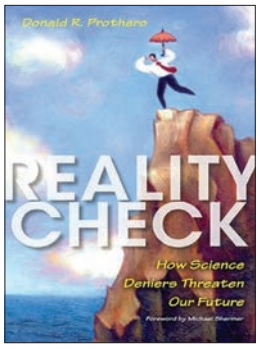
It is abundantly clear in *Think* that Harrison understands and explicitly admits that the claims he entertains are enormously interesting and gigantically appealing. He also understands that for this reason people are drawn to such claims and, let's face it, may be less critical and less skeptical than they ought to be about them, because they would really like it if there was a remnant population of plesiosaurs swimming in a Scottish lake, or if disease could be cured by drinking what is, effectively, water, or if we are the descendants of creatures from another planet. Harrison understands, however, and *Think* is predicated on the fact that as much as people (and scientists are people, so we are included here) might want to believe these things, they don't want to be fooled into believing that which is not so. His enumeration of the ways in which our brains can be fooled or misled in Chapter 2 (under the heading "Your Bizarre and Biased Brain") is, all by itself, worth the price of admission. I think the most significant gift that Harrison provides in *Think* is a skill set that enables us to avoid being fooled.

Harrison ends the book with a chapter that amounts to a love letter to the fascinating, captivating, surprising, and sometimes just plain weird universe in which we live. It's an extraordinary and lovely way to show how science doesn't suck the mystery out of life; rather, it celebrates it. *Think* is a book that should be on every skeptic's bookshelf, and, more importantly, the bookshelf of anyone who is not yet convinced that science is the best way to know. ■

Kenneth L. Feder is a professor of anthropology at Central Connecticut State University and author, most recently, of *Encyclopedia of Dubious Archaeology*. He is a Committee for Skeptical Inquiry Fellow and a SKEPTICAL INQUIRER consulting editor.

The Continuing Resistance to Acceptance of Reality

PETER LAMAL



***Reality Check: How Science Deniers Threaten Our Future*. By Donald R. Prothero.**
Indiana University Press, Bloomington, 2013.
ISBN: 9780253010292. 369 pp. Hardcover, $35.00

In *Reality Check: How Science Deniers Threaten Our Future*, Donald Prothero uses critical thinking and the scientific method to evaluate a variety of claims to determine whether they meet the standards of science. I have chosen for consideration three chapters of the nine that are devoted to particular nonscientific ideologies. As Prothero (emeritus professor of geology at Occidental College and lecturer in geobiology at the California Institute of Technology), points out, in each case there is a scientific discovery followed by a reaction by powerful antagonists to try to discredit the discovery.

The first example is the controversy regarding global warming. Since 2009 the debate has been intense, and according to Prothero the U.S. public is more confused than ever about what to believe. But Earth's temperature data show a sudden increase in temperature over the past century, unmatched in human history. This increase coincides with the Industrial Revolution and released greenhouse carbon dioxide from the burning of coal, gas, and oil. It is also clear that the Arctic, Greenland, and Antarctic ice sheets are melting, and the sea level is rising. Also, the evidence is clear that the acidity of the oceans is increasing at a very fast rate, causing mass extinction of coral reefs and the dissolving of marine shelled organisms.

Those who deny that there is global warming take a number of stands. One is to maintain that what is happening is just natural climatic variability. Another is that the climate records show cooling since 1998. A third is the notion that since carbon dioxide is good for plants, the planet is better off.

The scientific community, however, is virtually unanimous that there is global warming and that humans are the cause. For example, a 2009 survey of climate scientists familiar with the data found that 95 to 99 percent agreed that global warming is real and caused by humans. A 2010 study found that 98 percent of the scientists who actually do climate change research agree that global warming is human-caused.

The global warming deniers responded by, among other moves, offering what Prothero describes as "bribes" (93) to those who could be useful to them. The deniers touted their scientists, but it was discovered that fewer than 10 percent of them had appropriate credentials or direct research experience in climate research.

Interestingly, some big businesses (such as insurance companies) and also the Pentagon are taking global climate change very seriously.

The second nonscientific ideology is creationism or evolution denialism, the most widespread denial of reality in the United States discussed by Prothero and also the most difficult to overcome. At any given time in the United States creationist legislation or plans to teach creationism are pending before state legislatures or school boards. This ongoing situation contrasts with the fact that more than 99 percent of all scientists around the world accept the reality of evolution.

Prothero briefly describes some of the major sources of evidence that support the fact of evolution. These include homology, vestigial structures and other imperfections, embryology, and biogeography. Some specific facts are that roughly 98 percent of the human genome is identical to that of chimpanzees and gorillas. Insect pests evolve resistance to each new poison we expose them to. Also, a very high percentage of our DNA is functionally neutral, junk DNA inherited from far distant ancestors.

As a means of gaining entrance to public schools after many rulings prohibiting the teaching of creationism in them, the creationists came up with the concept of an intelligent designer. Publicly they maintained that the designer could be any number of gods or aliens. However, when speaking to religious audiences advocates of intelligent design creationism have admitted that their movement is a smokescreen for their real goal, which is to get their religious beliefs into the schools and to discredit evolution. Also, in recent years creationists have used a "teach the controversy" strategy, maintaining that

students should hear both sides of the argument.

There are standard creationist arguments that creationists never change regardless of how many times they are proven wrong. The arguments:

1. The Second Law of Thermodynamics disproves evolution because it says that order and complexity cannot arise from disorder.
2. Life is too complex a system to have occurred by random chance.
3. The Earth cannot be millions or billions of years old.
4. There are no transitional fossils that show how life evolved from one "kind" to another.
5. The Cambrian explosion showed that life arose suddenly, as described in the Bible.
6. Humans did not evolve from apes. There is no fossil record of human transitional forms.

Prothero refutes each of these assertions and also presents reasons why creationism is a threat to be taken seriously. One reason is that creationism is not only antiscience, but if allowed in public school curricula it would force the views of a sectarian minority on others. Another reason creationism is a threat is that its attack on evolution is the leading edge of an attack on all of science.

Also, Prothero has documented in a 2007 book that creationists have urged their school children to disrespect and harass their teachers. Most K-12 teachers do not even mention the topic of evolution because they fear retribution. Also, polls show that 20 percent of high school biology teachers are creationists.

The third case I review is concerned with human overpopulation. In 1974 the world's population reached four billion in less than half the time it took to go from two to three billion. Only thirteen years later, we reached five billion, and six billion in 1999. There were more than seven billion people in 2011. If previous rates continue there will be eight billion people by 2025. This is an example of exponential, as opposed to linear, growth. And many people have great difficulty understanding exponential growth because it is counterintuitive.

In 1977, Jimmy Carter said in a speech that in the 1950s and 1960s more oil was consumed than in all of previous human history. Many people refused to believe that. But it has been estimated that demand for oil could double by 2050 or sooner. The problem is that oil production may well have significantly diminished by then.

A fundamental problem is the widespread belief that growth is good. We measure our prosperity by such indicators as the Gross National Product and Gross Domestic Product, which indicate the rate at which the economy is growing. And politicians of all stripes tell us that growing the economy is a top priority. But the fact of limited resources and exponential growth will result in an economic crash.

Polls show that 20 percent of high school biology teachers are creationists.

On the positive side, many countries (such as India and China) have encouraged birth control and other measures to slow population growth. However, last November the Chinese government changed the law to allow two children, rather than one per family. There are signs that the very high population growth rates of the past few decades are slowing down and might eventually level off. At the same time, however, very high birth rates continue in much of the impoverished and underdeveloped world.

Prothero mentions some who claim that a world population of seven to fifteen billion people is no problem. These naysayers are convinced that somehow (unspecified) we will continue to feed a growing population.

The other nonscientific ideologies Prothero addresses are indicated by their chapter titles: "Betrayers of the Truth: Selling Out Science"; "Making the Environment the Enemy: Acid Rain, the Ozone Hole, and the Demonization of Rachel Carson"; "Jenny's Body Count: Playing Russian Roulette with Our Children"; "Victims of Modern Witch Doctors: AIDS Denialism"; "If It Quacks like a Quack: Snake-Oil Con Artists in an Era of Medical Science"; "What's Your Sign? The Ancient Pseudoscience of Astrology"; and "Down the Slope of Hubbert's Curve: The End of Cheap Oil and the Natural Resources."

In the last chapter, Prothero describes how the media foster scientific illiteracy. Television's cable channels that are supposedly science oriented, e.g., the Discovery Channel, The Learning Channel, the Science Channel, and the National Geographic Channel, have little or no science content. Instead they feature such subjects as ghosts, UFOs, and Bigfoot.

The truths of science are unwelcome to those who are unwilling to question their view regarding such matters as global warming, the end of cheap oil, the continually increasing human population, and evolution.

Also, despite the fact that 85 percent of Americans are high school graduates and that almost 30 percent get a college education, their ignorance of science is "staggering" (314). For example: Only 53 percent of adults know how long it takes for Earth to revolve around the sun, and only 59 percent know that dinosaurs and humans never coexisted. Studies show that the United States is near the bottom of industrialized nations in terms of scientific literacy.

This book is well worth reading, particularly for those not well-informed about the issues the book addresses.

Peter Lamal is a Fellow of the Division of Behavior Analysis of the American Psychological Association and Member of the Association for Behavior Analysis International.

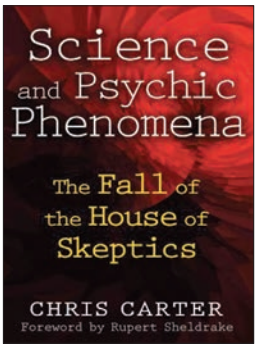
The House of Skeptics Serves Psi (and Crow)

BENJAMIN RADFORD

A press release for a recent book, *Science and Psychic Phenomena: The Fall of the House of Skeptics*, describes it as "Chris Carter's new book that takes on the skeptics and wins." Being a prominent skeptic, I was eager to see some meaty refutation of skeptical positions on psi and psychic phenomena. Unfortunately, his book had little in the way of real, evidence-based arguments and evidence. It was instead populated with mistakes; ad hominem attacks; recycled, long-refuted criticisms of skeptics; and straw man arguments.

Chris Carter (not the *X-Files* creator) has a background (and degrees) in economics and philosophy. Not psychology, which might help him understand the cognitive processes involved in both deception and self-deception regarding psi issues. Not statistics, which might help him understand the complex number-crunching involved in interpreting mountains of experimental data. Not experimental research design, which might help him spot design flaws in various psi experiments. Nor does Carter have any apparent knowledge of or training in any hard sciences—and certainly nothing that would qualify him to launch into the extended discussion of quantum physics that he does. This would not necessarily be a problem, except that Carter presents himself as an expert in physics. More on this later.

The book's subtitle claims that it describes the "House of Skeptics," but what does Carter know about skeptics? Apparently not much. Carter quotes



***Science and Psychic Phenomena: The Fall of the House of Skeptics*. By Chris Carter.**
Inner Traditions Press, 2012 (reprint from 2007).
ISBN 978-1594774515. 320 pp. Paperback, $18.95.

veteran CSI critic George Hansen as stating that "In keeping with CSICOP's one-sided approach, 'SI' [Skeptical Inquirer] has given scant attention to papers in well-known, orthodox scientific journals that present evidence for psi" (36). Carter demonstrates a glaring ignorance of his subject, one that can be easily fact-checked. Instead of "scant attention," Skeptical Inquirer has devoted considerable resources and coverage to psi research, including that of Gary Schwartz by Ray Hyman ("How Not To Test Mediums: Critiquing the Afterlife Experiments," the cover article in the January/February 2003 issue); on Gary Schwartz by Harriett Hall (March/April 2008); James Alcock on Daryl Bem's 2011 psi experiments (March/April 2011); Ray Hyman on Daryl Bem's 2011 psi experiments (March/April 2011); Amir Raz on psi research (July/August 2008); Ray Hyman on psi research (July/August 2008); and others. (And that doesn't even include Dale DeBakcsy's article in our January/February 2014 issue critiquing parapsychologist Dean Radin's book *Supernormal*.) Psi research has been covered just as much as, if not more than, other topics.

Many of Carter's "hard-hitting" criticisms are merely non sequiturs, such as that "The proportion of magicians in CSI is much higher than in the general population" (38). It's not clear where he got that factoid (he offers no data or statistics), nor is it clear what the relevance of such a statement is even if it were true. Ironically, Carter seems unaware that George Hansen, who he quotes extensively and from whom he cribs many decades-old complaints against skeptics, is himself a magician and member of the International Brotherhood of Magicians. If you're going to ridicule magicians' involvement in psi research, it is unwise to quote them in support of your claims about psi.

Carter predictably attacks James Randi's famous $1 million challenge, claiming that the testing is nothing "but a publicity stunt." Why? Carter offers various reasons, such as that "Randi himself acts as policeman, judge, and

jury" (123). Actually, this is completely inaccurate: Randi helps design the tests (which the claimants also help design and agree to), but he does not act as a judge; instead, a third-party person or panel agreed to by both the claimant and Randi is chosen, and Randi may not even be on the premises when the test is done. Often, in fact, there is no real "judge" at all but instead a set number of successes that everyone agrees must be met. For example, if a person claims they can correctly predict random numbers in a drawing, either they can do it at a rate higher than chance or they cannot; there is no possibility for biased judging by Randi (or anyone else) because there is nothing to "judge."

Furthermore, the claim that Randi "has never let anyone past the preliminary stage" is nonsensical. A person with genuine psychic (or other paranormal powers) cannot be prevented from passing the test in any way, by Randi or anyone else. If a psychic claims to be able to accurately dowse water or predict numbers ahead of a random-number generator, either they can do it or they can't. A person who correctly predicts random events far above chance (and does it on video camera, as per protocol) cannot be prevented from demonstrating his or her abilities, any more than a psychic can be "stopped" from predicting tomorrow's headlines.

These mistakes betray a fundamental misunderstanding by Carter not only of skeptical claims and procedures but of skepticism in general. This might be excusable in a slapdash blog by someone with little knowledge just touching on the subject, but when an author with two Oxford University degrees writes a 300-page book largely claiming to address skeptical arguments, this is troubling.

In several places even Carter is forced to admit that the evidence for psychic powers is weak, stating for example that "the overall hit rate so far seem fairly consistent at around 33 percent, when 25 percent is expected by chance. This corresponds with a hit about every third session, when chance would predict one out of four. This may not seem very impressive . . ." (103) and indeed it isn't. Carter basically blames scientists and skeptics for not accepting the low level of evidence offered for psychic ability and admits that current physics basically says that psi doesn't exist. One example: "Despite what . . . skeptics claim . . . it should be clear now that the existence of psi is consistent with the new metaphysics of science" (198).

Unable to muster a significant number of modern, working physicists to support his claim that psi exists (and that its roots lie in quantum physics), Carter is reduced to cherry-picking a handful of generally noncommittal quotes from scientists throughout history.

What is he talking about? What's this "new metaphysics of science" he's referring to? Quantum physics, which he knows nothing about and which he (and people like Deepak Chopra) love to cite and reference because it sounds mysterious and paranormal. Unlike Carter, I don't claim to understand quantum physics, but the real, actual physicists I've spoken to break out laughing at this crap. Nobel Prize–winning physicist Murray Gell-Mann, who certainly knows *something* about quantum mechanics, has dismissed claims about psi and physics as rubbish.

Unlike Carter, no skeptics are claiming that quantum physics supports the existence of psi. In science, as in law and logic, the burden of proof is on the claimant: the person making a claim has the burden of proving it. If Carter wishes to posit that quantum physics provides a plausible mechanism for psi, then it is his responsibility to show that, and he clearly fails to do so. Unable to muster a significant number of modern, working physicists to support his claim that psi exists (and that its roots lie in quantum physics), Carter is reduced to cherry-picking a handful of generally noncommittal quotes from scientists throughout history.

In a few especially revealing examples, Carter quotes physicists such as Nobel Laureate Brian Josephson and Olivier Costa de Beauregard making statements that seem open to the possibility of physics supporting psi. However, a quick look at the references reveals that those quotes date back to the mid-1970s. It seems very curious indeed that Carter must dig back nearly forty years to find quotes that (even superficially) support his theories. Were there no present-day working scientists familiar with advances in physics since Gerald Ford's presidency who Carter could find to bolster his claims?

Carter spends pages and pages discussing determinism and differing philosophies of science (his background is in philosophy, after all) and explaining why he believes that the old scientific paradigms are outdated and inadequate. Fair enough; so if our modern understanding of physics is wrong (though it seems to have worked pretty well so far), then how *does* psi work? Carter doesn't have an answer. What's the explanation for how psi could work? Carter doesn't have an answer. What published, peer-reviewed studies (in quantum physics or anywhere else) show the mechanism by which psi operates? Again, Carter doesn't have an answer. All he offers is a shrug, and bold self-assured predictions that quantum physics will figure it out one day.

Carter finds himself in a seemingly

untenable, semi-paradoxical position of trying to discredit classical physics while at the same time referencing research based on that same model in support of his claims. Carter can't totally dismiss and disregard our current models of physics, since the psi-positive studies he cites and references were conducted using that model (as far as I know, research conducted by people like Rupert Sheldrake, Daryl Bem, Robert Jahn, Charles Honorton, and others involved classical, not quantum, physics). Carter tries to claim that the unknown mechanism by which psi operates is (or might be) found in quantum physics, but even if that were true it would not invalidate classical physics as outmoded or explain away the fact that there is an inverse correlation between how strong a given psi experiment's controls are and how large an effect it finds.

I assume that in his areas of knowledge and expertise, economics and philosophy, Carter knows what he's talking about. Unfortunately, in *Science and Psychic Phenomena*, he is adrift with little or no understanding of statistics, physics, or even psychology. Unable to marshal strong evidence in support of psychic powers and forced to acknowledge that "psi is certainly incompatible with the old scientific view" (198), Carter is reduced to a lukewarm and topsy-turvy assertion that "nothing in quantum mechanics forbids psi phenomena" (228). Carter is fervently hoping that his readers don't realize that even if this is true (and despite his labored efforts to assure us that he understands the quantum physics he's talking about), *not ruling something out is quite different than supporting it*. In the real world, just because we don't rule something out as defying the laws of physics doesn't mean we say it's true—or even that there's any evidence for it at all.

If this book truly is the best attack that proponents of psi can muster—mottled as it is with poor scholarship, logical errors, and obvious factual mistakes—then the house of skeptics is on firmer ground than anyone imagined.

Despite its factual errors and many flawed arguments, *Science and Psychic Phenomena: The Fall of the House of Skeptics* is an interesting book, if for no other reason than that it provides insight into the mindset of many psi proponents. The fact that several prominent people, including Larry Dossey, Rupert Sheldrake, Jessica Utts, and Dean Radin—several of them smart people who should know better—have endorsed Carter's book as some sort of masterful discrediting of skepticism is revealing. If this book truly is the best attack that proponents of psi can muster—mottled as it is with poor scholarship, logical errors, and obvious factual mistakes—then the house of skeptics is on firmer ground than anyone imagined. ■

Benjamin Radford is a research fellow of the Committee for Skeptical Inquiry, deputy editor of the Skeptical Inquirer, and author or coauthor of a number of books, including *Scientific Paranormal Investigation* and *The Martians Have Landed: A History of Media-Driven Panics and Hoaxes.*

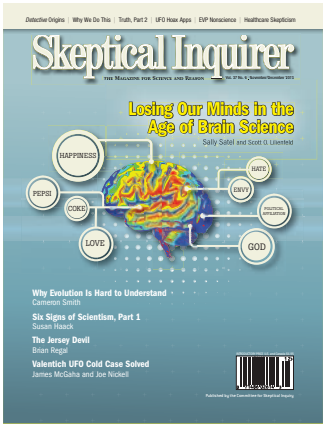
Guide for Authors

The Skeptical Inquirer appreciates editorial submissions from knowledgeable scientists, scholars, writers, and investigators.

But before submitting a manuscript (feature article, review, commentary, column, or special report), please read our updated and expanded Guide for Authors. It is on our website at:
www.csicop.org/publications/guide

It provides guidelines on length, form, style, and references and gives submittal instructions.

—The Editors



Irrational Exuberance

What I liked most about Satel and Lilienfeld's superb "Losing Our Minds in the Age of Brain Science" (SI, November/December 2013) was their insistence that human activity unfolds at a number of explanatory levels (e.g., biological, psychological, social), and that it's pointless to try to explain everything in the lower levels. I was reminded of philosopher Daniel Dennett's description of "Greedy Reductionism" in *Darwin's Dangerous Idea* (1995), defending the virtues of "bland" reductionism against straw-man versions of it:

> According to the preposterous readings, reductionists want to abandon the principles, theories, vocabulary, laws of the higher-level sciences, in favor of the lower-level terms. A reductionist dream, on such a preposterous reading, might be to write "A Comparison of Keats and Shelley from the Molecular Point of View" or "The Role of Oxygen Atoms in Supply-Side Economics," or "Explaining the Decisions of the Rehnquist Court in Terms of Entropy Fluctuations." Probably nobody is a reductionist in the preposterous sense.

As Satel and Lilienfeld point out, however, some claims about neuroscience have reached preposterous proportions. We're not quite explaining economics at the chemical level, but *neurofinance* is coming close. Finance Professor Andrew Lo, in his paper "Fear, Greed and Financial Crises: a Cognitive Neurosciences Perspective," sees hope in neuroscience to "identify more fundamental drivers of financial crises and improve our models and methods for dealing with them." John Coates, former derivatives trader and now neuroscience researcher, has measured biological parameters of London traders, indicating that testosterone and cortisol "signal economic risk and return." Of course it immediately follows that "the waves of irrational exuberance and pessimism that destabilize financial markets may simply be traceable to hormones." Thus, Coates advises companies to monitor their workers' body chemistry, as if that chemistry would provide more information than a trader's actual transactions and positions.

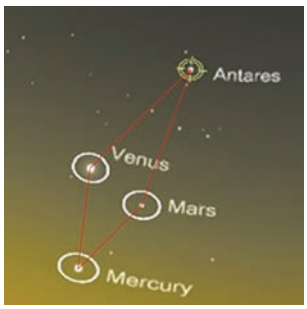
It seems irrational exuberance not only leads to boom-and-bust cycles in the economy, it also leads to greedy scientists' "eagerness for a bargain, trying to skip whole layers or levels of theory in their zeal to explain too much too fast" (yep, another Dennett quote).

John Vos
Leuven, Belgium

Valentich Star Pattern

I found the article "The Valentich Disappearance: Another UFO Cold Case Solved" by James McGaha and Joe Nickell (November/December 2013) highly informative, very well written, and able to convey many details about this previously cold case. The centerpiece of the article is the identification of a bright and relatively unusual celestial star pattern—apparently mistakenly taken as a UFO by the pilot. This diamond-shaped pattern consists of the planets Venus, Mars, and Mercury and the star Antares.

However, I feel that the quality of the article would have been further enhanced if the star pattern had actually been shown by the authors. This has now been done. Based on the time information given in the text, which is October 21, 1978, 19:06 local time (corresponding to 9:06 UT), and the pilot's approximate location, 40 degree South and 146 degree East, according to the geographic information in the text, a set of .jpg pictures has been produced.



The diamond shape of this quasi-asterism is very distinct and remarkable. The impression could have been further enhanced by atmospheric seeing effects. The .jpg has been created through Digistar 5 by Evans and Sutherland. Credit for creating the pics goes to Levent Gurdemir and Amy Barraclough at the Planetarium of the University of Texas at Arlington.

Manfred Cuntz, PhD
Professor of Physics
University of Texas at Arlington

Why Evolution Is Hard to Understand

In "Why Being Human Makes Evolution Hard to Understand" (November/December 2013) Cameron Smith argues that we humans are so accustomed to our own inventive creation that other explanations for apparent design in nature simply do not cross our minds. I think that must be only half the story. The other half is simply empirical: We almost never encounter any system outside nature that appears designed but is not. Try to think of one. The only one that occurs to me is the English language (or the French, Spanish, etc. languages). Can anyone suggest another?

Gordon B. Hazen
Professor, Industrial Engineering and Management Sciences
Northwestern University
Evanston, Illinois

Cameron Smith's article posits a problem that is not satisfactorily backed by empirical data. The idea that evolution is hard to understand is not adequately justified. He simply claims that it is misunderstood in the media. I disagree. Evolution is very well understood in the majority of developed nations because it is taught in the public school curriculum as fact.

Perhaps Dr. Smith is more narrowly focused on the United States, though he doesn't qualify which media, and where, suffer from such misunderstanding. His suspect claim seems more like a pretext to argue for a thesis about how the human mind and culture evolved to reinforce a belief that complexity is a hallmark of human invention. Hence people see life or species as requiring a creator. His thesis fails at one critical point. He writes, "What do I mean when I say that this proaction has 'stamped' us to think in a particular way? The mechanism is unclear, but the effects are real."

Oh really? Unclear mechanisms are the hallmark of pseudoscience. Rather than Smith's longwinded (and poorly articulated, in my opinion) thesis, I would suggest a lesson from Occam. If evolution is misunderstood by some in the media, it is simpler to suppose that members of the media in the United States are poorly educated about evolution. Media among many of our European and Australian and

Asian friends don't seem all that confused.

If people choose to not believe that species originate (and disappear) through evolution, I suggest psychological impediments, like cognitive dissonance, are at work. For example, if someone is taught from a young age to believe in a biblical (or other religious/cosmological) explanation for human origins, such beliefs are tied to respect for parental or religious authority. It is difficult to reject the love that these patrons give to a young child. So rejecting a creator-based belief is entangled with rejecting that patronage. How can my parent teach me something that is untrue? Does that make her/him unreliable or a bad person? Over time, it is not that the creator explanation is better. It is that its rejection is psychologically harder than accepting a contradictory explanation.

Bernard Roth
Santa Barbara, California

Cameron Smith suggests that the key feature distinguishing human language from other (earlier, non-human) communication systems is the flexible open-endedness of word meanings, which arises out of the essential arbitrariness of linguistic meaning; indeed, the same word-form can have *opposite* meanings in different languages or even within one language, as in English *let* ("allow") and *let* ("hinder"; now confined to a small range of contexts including let-calls in tennis). This feature is indeed crucial, especially in some contexts, but it is important to realize that language has several other key distinctive functional characteristics, such as its ability to refer to entities not actually present at the time of an utterance, as in *Sirius* or *yesterday*, and to distinguish between individual entities (entity-tokens) and entity-types (as in *this tiger* versus *the species Tiger*)—as well as unique formal features, notably "double articulation" (organization into individually meaningless phonemes which, in combination, make up meaningful morphemes/words) and grammar and especially syntax (the grammar of phrases, clauses, and sentences).

Mark Newbrook
Linguistics Consultant to
ASKE and UK Skeptics
Barrow in Furness
Cumbria
United Kingdom

Signs of Scientism

One of the six signs of Scientism in Haack's article in the November/December 2013 issue of SI describes "adopting scientific trappings purely decoratively" rather than "serious use" and "take the achievements of physics as the standard of self-appraisal." This behavior is found not only in social sciences and philosophy as she indicated, it also can be seen in popular culture everywhere. Deepak Chopra's "quantum healing" is one such example where he claims health imbalance is caused by quantum phenomena. His misuse of the term *quantum* and the naked opportunistic commercialism aren't even worth any words of counterargument. Other examples can be found in the "scientific equipment" and terminology favored by those ghost hunters or any garden varieties of paranormal "investigators" seen on TV.

As described in Michael Specter's *Denialism: How Irrational Thinking Hinders Scientific Progress, Harms the Planet, and Threatens Our Lives*, people in the United States and Europe increasingly reject scientific truths; instead they embrace pseudoscience about such things as vaccine safety and organic food. What troubles me is this: while "scientism" has penetrated non-academic culture where people like Deepak Chopra found it beneficial to sound scientific and use "big terms" to feel authoritative, this phenomenon exists at the same time when people reject science. One obvious answer is that "pseudoscience" is inherently more attractive than "real science" because the former often provides simplistic, linear cause-and-effect—thus more comfortable answers. It is such an uphill battle to combat pseudoscience!

Mio Sam Lao
Haymarket, Virginia

Not to disagree with Susan Haack ("Six Signs of Scientism, Part 1"), that the term *pseudoscience* may properly be applied to the creation science movement in general. But some related ideas appear compatible with proper science.

The search for an "irreducible complexity" is one example. If it could be shown that just one complex biological phenomenon could not have evolved from something simpler, Darwin's theory would be falsified. It is useful that Professor Michael Behe has tried to falsify it and failed, citing the cases of the bacterial flagellum and ATP sythesase. It is irrelevant that Behe is motivated by other than scientific curiosity.

Donald Rooum
London, England

Fox News Effect?

The article you cited in your SI piece entitled "The Fox News Effect: Media Use and Global Warming Denial" (November/December 2013) strikes me as confusing correlation and causation. There is no doubt that conservatives are more likely to use conservative news and information media while liberals are more likely to use the mainstream liberal media. It is also clear that the two breeds of media tend to offer contrasting views about climate science (and practically everything else). This does not mean, though, that the media are causing liberals and conservatives to hold the views they hold about global warming (or anything else). It is more likely that people who already hold particular views are more likely to seek out the media outlets that reinforce those views. That conclusion, it seems to me, is the only scientifically defensible one based on the data presented.

Even if the reported correlations did signal a causal process, it would simply confirm the social psychological fact that people's views can be influenced by the persuasion messages they receive. It would not confirm, as the piece implies, that conservative outlets promote falsehood and liberal media promote truth. Try this thought experiment: Suppose for just a moment that global warming has little or nothing to do with human activity. Now which outlets are promoting truth and which falsehood?

I think that skeptics should remain skeptical about everything, including science in general, and their favorite scientific findings in particular.

Douglas A. Bernstein, PhD
Department of Psychology
University of South Florida
Bonita Springs, Florida

Detective Business

Much as I admire the usual thoroughness of Joe Nickell's investigations, I feel he fails to do justice to Wilkie Collins by failing to mention his novel *The Moonstone*. ("*Detective:* Uncovering the Mysteries of a Word," November/December 2013). It was published in 1868, only two years after Emile Gaboriau's *L'Affaire Lecoque*, and was described by T.S. Eliot as "the first and greatest of English detective novels. . . . In detective fiction England probably excels other countries; but in a genre invented by Collins and not by Poe" (Eliot, T.S., "Wilkie Collins and Dickens" in *The Victorian Novel: Modern Essays in Criticism.* Ed. Ian Watt. Oxford University Press, 1971).

The word *detective* appears several times in *The Moonstone*. Near the end of Chapter 14, Sergeant Cuff, Collins's principal

investigator, addresses the family servant Mr. Betteredge:

> "Mr. Betteredge," says the Sergeant, "you have done a very foolish thing in my absence. You have done a little detective business on your own account. For the future, perhaps you will be so obliging as to do your detective business along with me."

Fraser G. Dingwall
Javea (Alicante)
Spain

Joe Nickell replies:

Had I been compiling a lengthy encyclopedia entry on detective literature, *I might've found deserved space for Wilkie Collins. Let me repeat, though, that Poe wrote the first real detective story in the English language, or in any language, in 1841—twenty-seven years before Collins's 1868 novel—and French writer Emile Gaboriau published the first detective novel in any language in 1866.*

One can only give the Englishman Collins supremacy over the American Poe by redefining the genre in some new, esoteric way, as does Eliot (an expatriate American who became a British subject). (See a source Mr. Dingwall seems to have consulted: http://www.victorianweb.org/authors/collins/sahnil.html; accessed December 20, 2013). However, most authorities rightly acknowledge Edgar Allan Poe as creator of the genre, in which the standard award of excellence is the "Edgar," not the "Wilkie." I hope my "usual thoroughness" is still apparent, and I thank the writer for the compliment.

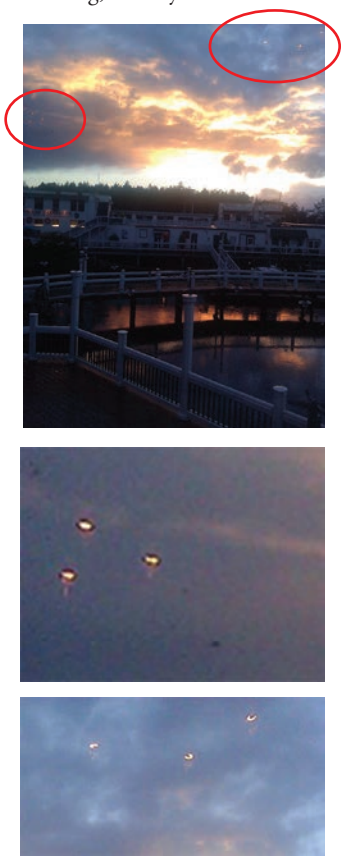
Medical Criticisms

I was taken aback by the intensity of the diatribe against the American medical profession by Kenneth Krause ("Science Watch," "Taking Our Medicine: What Hope for Skepticism in Healthcare?" November/December 2013). Many of the topics he discusses, such as a lack of national standards, are safeguards against stifling regulation, which would impede creative solutions to individual patient problems—one size does not fit all. The lack of national standards does, however, make Krause's job more difficult. To see some of the harm that "national standards" can do, look no farther than the Medicare rules and guidelines that have resulted in unnecessary IV medications and anticoagulants being given to patients for whom there are relative contraindications. Doctors individually have to pass either National Boards (in the past) or USMLE to become licensed in the various states. Not so with other professions.

P.C. Weber
Olney, Illinois

UFOs in Formation?

During a recent trip to Roche Harbor in the San Juan Islands of Washington state, my husband and I were sitting in a waterfront restaurant and enjoying the amazing, stormy sunset when I decided to take a photo with my cell phone. What to our surprise should appear in the same photo but a bunch of UFOs: The three on the upper left, flying (as you can see) in formation and three more in a less structured, but equally interesting configuration, in the upper right.



These UFOs were seagulls, whose snowy white chests were reflecting the low golden light of the sunset, as the rays slanted through breaks in the storm clouds—but wouldn't they get some folks excited? Also, with regard to the phenomenon of seeing faces in things (such as the Jesus on a tortilla)—look at the upper right "UFO"—can you see the wolf's face with the glowing eyes? Pretty scary, to be sure!

Anyway, I thought you would appreciate this interesting photo, which could easily have been making its way around the Internet as a genuine UFO sighting right now. Heck, if I had played my cards right, maybe I could have made some money off of it!

Linda Dacon
Port Townsend, Washington

New Atheists and Old Testament Christians

In his letter (November/December 2013) in response to my letter (July/August 2013) re the New Atheists—in which I suggest that a greater measure of humility and civility by scientists/atheists toward believers would be more effective in "reaching" the latter re scientific facts, processes, and principles, Garry Loucks notes that he struggled "with the pressure put upon me by the conservative Christian community in which I was reared." It sounds like that community was what many of us call "Old Testament Christians"—the type who cherry-pick the Old Testament to support narrow, unloving, unforgiving, and often un-Christian positions. And I am saddened that he went through that.

However, not all Christians are conservative; indeed, the majority are not. In this regard, when Mr. Loucks points to a passage in Exodus to suggest that Christianity contains "horrific" laws, it is clear that his former "community" erred in its theology by ascribing Old Testament Law to Christians. According to multiple passages in the New Testament, Jesus came to fulfill "the law," once for all, and replace "the law" with "grace." Indeed, one would be hard-pressed to find any "horrific" laws in the New Testament, instead finding innumerable references to loving one's neighbor, caring for the poor, and being humble, peaceable, forgiving, and compassionate.

I was not suggesting in my letter that scientists and skeptics "kow-tow" to or even accept the often dated and theologically questionable positions of some Christians. I was merely stating that disdain, denigration, condescension, and dismissal do not engender openness, responsiveness, and acceptance. I reiterate that if the scientific and skeptical communities have any real desire—or expectation—to get believers to understand and accept scientific facts, etc., they must rethink the way they approach believers, and that this includes at least a modicum (if not more) of humility and civility.

Rev. Ian Alterman
New York, New York

[FEEDBACK

The letters column is a forum on matters raised in previous issues. **Letters should be no longer than 225 words.** Due to the volume of letters we receive, not all can be published. Send letters as email text (not attachments) to letters@csicop.org. In the subject line, provide your surname and informative identification, e.g.: "Smith Letter on Jones evolution article." Include your name and address at the end of the letter. You may also mail your letter to the editor to 944 Deer Dr. NE, Albuquerque, NM 87122.

[THE LAST LAUGH BENJAMIN RADFORD, EDITOR

SKEPTICAL ANNIVERSARIES

by Tim Farley

March 13, 1884: The Seybert Commission first met at the University of Pennsylvania; its three-year investigation into Spiritualism and mediums found nothing but fraud.

March 19, 1954: A U.S. Federal court issued an order that Wilhelm Reich's "orgone accumulators" be destroyed as illegal medical devices under FDA rules.

March 19, 1994: Jose Escamilla first captured the paranormal entities he calls "rods" on film; they are actually rapidly moving insects blurred by the mechanisms of modern cameras.

March 23, 1914: Magician, writer, and skeptic Milbourne Christopher, who helped found CSICOP in 1976, was born. He died in 1984. He is listed in CSI's Pantheon of Skeptics established in 2011.

March 23, 1989: Stanley Pons and Martin Fleischmann announced the discovery of cold fusion in a press conference, setting off a modern scientific controversy. No one has replicated their experiments.

April 12, 1869: Spirit photographer William Mumler is formally charged with fraud in New York City. P.T. Barnum testifies against him in his trial later that month. Mumler is eventually acquitted in early May.

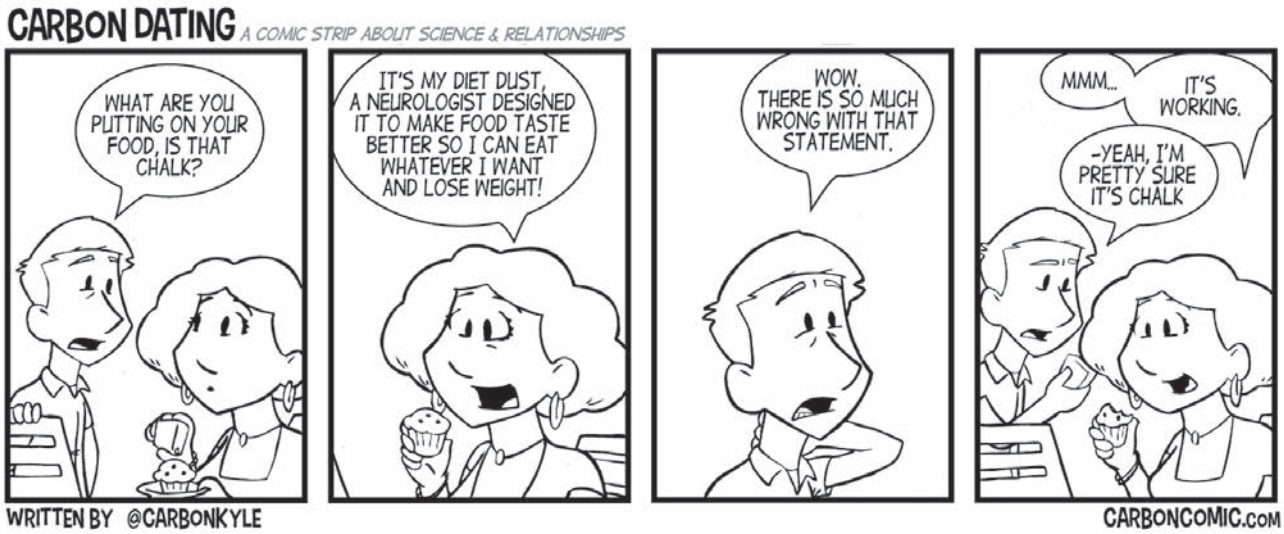
April 15, 1954: A modern mass hysteria panic known as the "Seattle windshield pitting epidemic" peaked.

April 21, 1934: The famous "Surgeon's photograph" of the Loch Ness monster was published in London's *The Daily Mail*. It is now known to have been hoaxed.

April 24, 1964: New Mexico police officer Lonnie Zamora encounters a UFO in a famous incident. Some recent evidence indicates he may have been the victim of a prank by local college students.

April 29, 1999: Sylvia Browne appears on *The Montel Williams Show* and declares that missing child Opal Jo Jennings was alive and sold into slavery in Japan. Her remains were eventually found less than fifteen miles from her house.

Tim Farley is a research fellow with the James Randi Educational Foundation and created the website whatstheharm.net.


CARBON DATING
A COMIC STRIP ABOUT SCIENCE & RELATIONSHIPS
WHAT ARE YOU PUTTING ON YOUR FOOD, IS THAT CHALK?
IT'S MY DIET DUST, A NEUROLOGIST DESIGNED IT TO MAKE FOOD TASTE BETTER SO I CAN EAT WHATEVER I WANT AND LOSE WEIGHT!
WOW. THERE IS SO MUCH WRONG WITH THAT STATEMENT.
MMM... IT'S WORKING.
-YEAH, I'M PRETTY SURE IT'S CHALK
WRITTEN BY @CARBONKYLE
CARBONCOMIC.COM

MYSTERY SOLVED
I CAN IMAGINE THEIR DISAPPOINTMENT.
DISAPPOINTMENT, INDEED. IMAGINE THE PLIGHT OF THE AMPUTEE!
EX-EXCUSE ME. I THINK THAT MAY BELONG TO ME.
WE GOT THE WRONG LEG
...AND SO THEY CAUGHT HIM AND CHOPPED OFF THE OTHER LEG.
IT, UH, WAS ALSO NOT MAGIC.
IT ALL LEAVES ME STUMPED.
MM, QUITE.
JOIN THE COLONEL NEXT ISSUE FOR ANOTHER MYSTERY SOLVED!
WORDS: ZACK KRUSE - @ZACKKRUSE ART: JIM MILLER - @THEBIGGEST JIM COLOR: MATT GROSS - @MATTYLEEGROSS
VISIT: MYSTERYSOLVEDCOMIC.COM
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Independent Investigations Group (IIG), Center for Inquiry–*West*, 4773 Hollywood Blvd, Los Angeles, CA 90027. Tel.: 323-666-9797. www.iigwest.com

The James Randi Educational Foundation. James Randi, Director. Tel: (213)293-3092; Email jref@randi.org. 7095 Hollywood Blvd. No.1170, Los Angeles, CA 90028. www.randi.org

Sacramento Skeptics Society, Sacramento. Terry Sandbek, President. 4300 Aubum Blvd. Suite 206, Sacramento CA 95841. Tel.: 916 489-1774. Email: terry@sandbek.com

San Diego Association for Rational Inquiry (SDARI) President: Paul Wenger. Tel.: 858-292-5635. Program/general information 619-421-5844. www.sdari.org. Postal address: PO Box 623, La Jolla, CA 92038-0623

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The organizations listed above have aims similar to those of the Committee for Skeptical Inquiry but are independent and autonomous.
Representatives of these organizations cannot speak on behalf of CSI. Please send updates to Barry Karr, P.O. Box 703, Amherst NY 14226-0703.
International affiliated organizations listed at www.csicop.org.

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